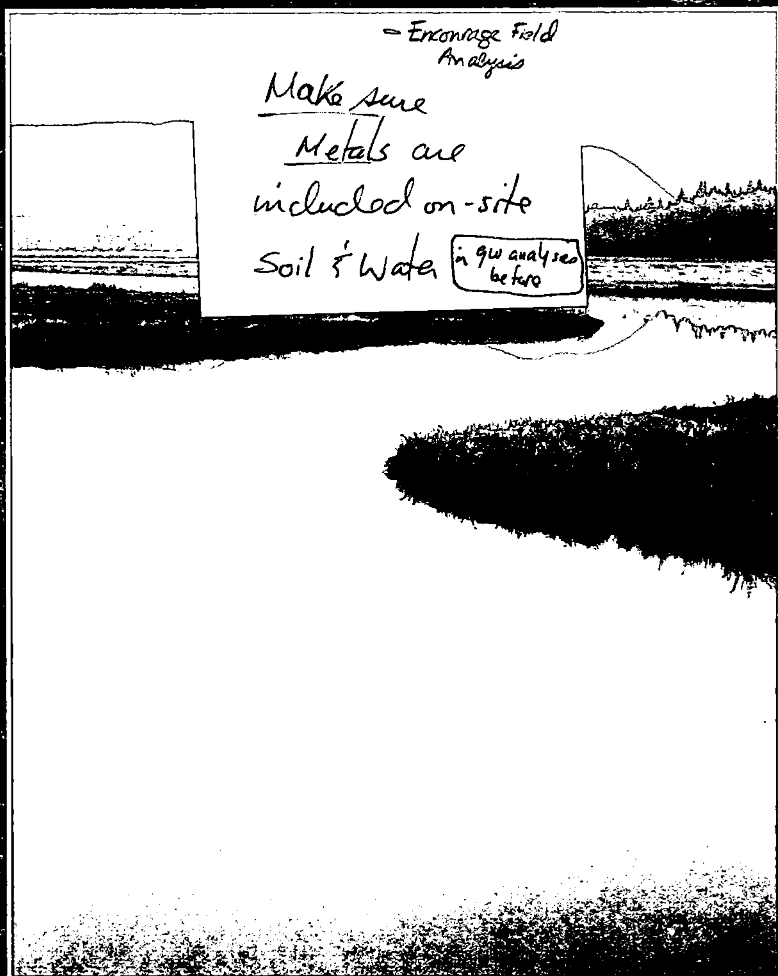

— Encourage Field Analysis

Make sure Metals are included on-site Soil & Water

in gw analyses before

McLaren Hart

Prepared For:

Ortho Diagnostic Systems, Inc.
1001 US Highway 202
Raritan, New Jersey 08869

Prepared by:

McLaren/Hart Environmental Engineering Corp.
25 Independence Blvd.
Warren, New Jersey 07059

July 1, 1996 (Revised)

RCRA FACILITY INVESTIGATION WORK PLAN ADDENDUM

Ortho Diagnostic Systems, Inc.
Raritan, New Jersey

VOLUME I of III

NJD 068 715 424

10B2

Prepared For:

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WORK PLAN ADDENDUM

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VOLUME I of III

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* Note: Due to their extensive volume, the attachments referenced for Appendix III were not reproduced for this submission. The attachments were included in the November 4, 1994 draft of the RFI Work Plan Addendum in response to EPA's request for this information which was listed as deficient in the June 30, 1993 Dames & Moore Draft RFI Report.

EXECUTIVE SUMMARY

On behalf of Ortho Diagnostic Systems, Inc. (Ortho), McLaren/Hart Environmental Engineering Corporation (McLaren/Hart) is submitting this revised RCRA Facility Investigation (RFI) Work Plan Addendum. The November 4, 1994 RFI Work Plan Addendum was originally prepared by McLaren/Hart in response to comments made by the Environmental Protection Agency (EPA) to the June 30, 1993 Draft RFI Report prepared by Dames & Moore. McLaren/Hart provided EPA with a revised RFI Work Plan Addendum, dated June 6, 1995 in response to EPA's April 13, 1995 comments to the November 4, 1994 RFI Work Plan Addendum.

During September 1995, Ortho was notified that a new case manager from both the EPA and from the New Jersey Department of Environmental Protection (NJDEP) were being assigned to the case. A site visit and meeting were held between the new EPA case manager, the new NJDEP case manager, Ortho and McLaren/Hart on September 21, 1995. During the September 21, 1995 meeting, two new additional areas of potential environmental concern were discussed: a former 550 gallon gasoline underground storage tank (UST) located immediately north of the water tower, east of Building H; and the process and sanitary sewer line that runs eastward through the neighboring Tokyo Boeki property.

The former gasoline UST was discovered during implementation of a non-RCRA related field task (pH equalization project) conducted by McLaren/Hart at the site in the summer of 1995. McLaren/Hart immediately obtained a closure permit from NJDEP, and the UST was removed on September 14, 1995. Upon the discovery of several small corrosion holes in the UST, McLaren/Hart and Ortho promptly reported the incident by contacting the NJDEP Spill Hotline, and Case # 95-9-14-1434-1 was assigned. McLaren/Hart also notified the new NJDEP case manager for the RCRA Corrective Action project. Post-excavation soil samples collected by McLaren/Hart indicated the presence of total xylenes at two (2) locations in the excavation where concentrations exceeded the NJDEP Impact to Groundwater Soil Cleanup Criteria. However, no further excavation was conducted due to the presence of weathered bedrock at the base of the excavation and due to the proximity of the eight (8) inch diameter process and sanitary sewer line which runs along the northern edge of the UST excavation. The UST Closure Report for the former 550 gallon gasoline UST is included in Appendix V of this work plan.

On December 4, 1995, McLaren/Hart attempted the installation of a monitoring well within the backfilled excavation of the former gasoline UST, but the well had to be abandoned due to difficulties encountered during the installation. Subsequently, it was agreed by EPA and NJDEP that McLaren/Hart would install a shallow monitoring well in first water (i.e., perched water) to determine if it had been impacted. Therefore, on April 22, 1996, a shallow monitoring well (MW-33) was installed. Results of groundwater sampling conducted on May 8, 1996, indicated concentrations of total xylenes above the NJDEP Class IIA Groundwater Quality Standard. Additional investigation is proposed in Section 3.3.1.7 of this addendum.

The second new area of potential environmental concern discussed during the September 21, 1995 meeting was the process/sanitary sewer line system. EPA and NJDEP informed McLaren/Hart and Ortho that results of an environmental investigation at the neighboring Tokyo Boeki facility suggested that the two Ortho process/sanitary sewer lines which cross the Tokyo Boeki property represented a suspected source of contamination on the property. McLaren/Hart subsequently scheduled an appointment with NJDEP to review files associated with the environmental investigation completed at the Tokyo Boeki property. Remedial actions were conducted by Tokyo Boeki during the summer and fall of 1995 to remove buried drums on the property.

At EPA's request, a second meeting was held with Ortho, McLaren/Hart and NJDEP at EPA offices in New York City on December 14, 1995 to discuss the new areas of potential environmental concern, and additionally, to review EPA and NJDEP comments to the June 6, 1995 RFI Work Plan Addendum. During the December 14, 1995 meeting, it was agreed that the RFI would be separated into two (2) phases, the first of which would focus on source characterization related tasks at areas of concern, and the second which would rely on the results of the first phase to direct an appropriate course of action for investigating the groundwater, where necessary. In addition, EPA indicated that the recently discovered gasoline UST, east of Building H, would require formal notification of this area as a Solid Waste Management Unit (SWMU). A SWMU notification letter, dated December 21, 1995, was subsequently sent to EPA by McLaren/Hart. During the December 14, 1995 meeting, it was agreed that the requirement of a SWMU Assessment Plan for the process sewer line system would be deferred until soil sampling results were received by NJDEP for the Tokyo Boeki property. McLaren/Hart interpreted this to indicate that notification of the process/sanitary sewer line system as a SWMU was also deferred. In response to EPA's comments on McLaren/Hart's December 22, 1995 letter detailing the minutes of the December 14, 1995 meeting, McLaren/Hart subsequently provided EPA with a SWMU notification letter for the process sewer line system in a letter dated February 5, 1996.

At the December 14, 1995 meeting, it was agreed that the proposed Phase I source characterization activities would be summarized in an RFI Work Plan Addendum II. In subsequent telephone conversations with EPA, it was decided that the submission of revised pages for inclusion in a revised RFI Work Plan Addendum would be an appropriate format for this submission. Accordingly, McLaren/Hart prepared and submitted a revised RFI Work Plan Addendum dated February 29, 1996.

On May 8, 1996 Ortho received comments from EPA and NJDEP on the February 29, 1996 RFI Work Plan Addendum. In subsequent telephone conversations with EPA and NJDEP, it was decided that the submission of the revised pages and/or sections for inclusion in this RFI Work Plan Addendum would be an appropriate format for this submission. However, due to the extent of revisions and new information provided in this draft of the RFI Work Plan Addendum, a complete copy of the addendum has been assembled for submission to EPA and NJDEP. The only items not included in this copy are the attachments to Appendix III which may be found in Volume II of the February 29, 1996 RFI Work Plan Addendum, but were not reproduced in this addendum due to the excess volume of data in these attachments. The format of the original RFI Work Plan Addendum, dated November 4, 1994, has been retained to correspond with the HSWA Permit. As a result, this format necessitated that the original text describing the proposed groundwater investigation tasks remain, although it is understood that a Phase II groundwater investigation work plan addendum will be prepared upon completion of the Phase I investigation.

The list of revisions and/or additions to the February 29, 1996 RFI Work Plan Addendum, which have been incorporated into this July 1, 1996 RFI Work Plan Addendum is as follows:

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Executive Summary

Section 2.0	Project Management Plan	
	Section 2.2	Schedule
	Section 2.3	Project Team Organization and Project Management
Section 3.0	Supplementary RFI Activities	
	Sections 3.3.1.1 through 3.3.1.7	
Section 6.0	Health and Safety Plan	

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Figure 2-2	Project Organization Chart
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Figure 3-2	Process/Sanitary Sewer Mains
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Appendix I	Project Team Resumes
Appendix II	Health & Safety Plan
Appendix V	UST Closure Report
Appendix VI	Permit Requested Information for New SWMUs
Appendix VII	EPA Requested Information for New AOC
Appendix VIII	Response to EPA's May 8, 1996 comments on the February 29, 1996 RFI Work Plan Addendum
Appendix IX	Dames & Moore June 19, 1992 Site Assessment Plan Report - Methanol Tank Closure

As identified above, Appendix VIII of this RFI Work Plan Addendum provides a directory for the appropriate responses to EPA's May 8, 1996 comments on the February 29, 1996 RFI Work Plan Addendum.

In addition, pursuant to EPA / NJDEP's request, one copy of the on-site and off-site sewer videotapes are included. The videotapes are included only in the submission to EPA. During the preparation of this work plan addendum, two (2) additional areas of concern were identified:

- The discovery of two (2) 4800 gallon methanol tanks that were removed by Dames & Moore in 1991; and

- The discovery of petroleum impacted soils through construction/excavation activities adjacent to west side of Building D.

A copy of the June 19, 1992 Dames & Moore Site Assessment Plan Report for the Methanol Tanks Closure, has been included as Appendix IX. The Dames & Moore closure report is not believed to have been previously submitted to NJDEP and EPA. However, McLaren/Hart's review of the data in the closure report indicates no significant impacts to soil or groundwater. As a result, on behalf of Ortho, McLaren/Hart requests no further action with respect to the former Methanol Tanks. OK ?, document of summary once all results are in

The second area of concern was discovered on June 10, 1996 during construction of an addition on the western side of Building D of the Ortho facility. Petroleum-impacted soils were encountered during excavation activities along the western side of Building D. In response to this discovery, Ortho immediately contacted the New Jersey Spill Hotline to provide notification of the release, and Spill Number 96-6-10-1516-02 was assigned. Ortho then contacted the EPA and NJDEP case managers on June 10, 1996 to inform them of the release. McLaren/Hart contacted both NJDEP and EPA to discuss an immediate remedial action so that construction activities could resume. It was agreed that the impacted soils would be removed, followed thereafter by the collection of post-excavation soil samples. If analytical results from the post-excavation soil sampling indicated that concentrations were below the NJDEP Soil Cleanup Criteria, then construction activities could resume.

On June 11, 1996, soils were excavated from this area under the supervision of McLaren/Hart, and post-excavation soil samples were collected. The analytical results from these samples did not indicate the presence of any constituents above NJDEP Soil Cleanup Criteria. McLaren/Hart notified EPA by telephone that construction activities were scheduled to resume based on the analytical results, and the results were subsequently faxed to EPA on June 14, 1996. EPA indicated that this approach was acceptable. The results of the soil remedial activities will be included in the revised RFI Result Report. In light of these results, on behalf of Ortho, McLaren/Hart recommends no further action for this area of concern.

available now?
3/97?

1.0 INTRODUCTION

This RFI Work Plan Addendum presents the scope of work for supplemental investigative activities as necessary to respond to EPA's May 11, 1994 comments on Ortho Diagnostic Systems, Inc.'s (Ortho) June 30, 1993 RFI Report. Due to the breadth of EPA's comments, the supplemental activities described herein fall under five broad RFI categories, including Facility Background, Environmental Setting (hydrogeology and soils), Contaminant Characterization (soils and groundwater), Risk Assessment and preparation of a Revised RFI Report. The activities that will be performed in each of these categories are described in Section 3.0.

The background of relevant RFI activity leading up to this Work Plan Addendum is as follows. Ortho conducted a RCRA Facility Investigation (RFI) at their Raritan, New Jersey facility during 1990, 1991 and 1992. The RFI was conducted in accordance with the RFI Work Plan dated August 17, 1990 that was approved by EPA Region II in November, 1990. Ortho's Draft RFI Report was submitted to EPA for review on June 30, 1993. EPA subsequently provided Ortho with comments on the Draft RFI Report under a cover letter dated May 11, 1994. In their letter, EPA directed Ortho to prepare an RFI Work Plan Addendum for collecting and evaluating additional field data and related information as specified in EPA's comments.

As an addendum to the EPA-approved RFI Work Plan, all activities described herein will be performed under the provisions and guidelines set forth in the RFI Work Plan and its component sub-plans except as noted herein. A revised Project Management Plan is provided in Section 2.0. Specific modifications to the Data Collection Quality Assurance Plan, Data Management Plan and Community Relations Plan are provided in Sections 4.0, 5.0 and 7.0, respectively. A revised Health and Safety Plan is provided in Section 6.0.

2.0 PROJECT MANAGEMENT PLAN

2.1 TECHNICAL APPROACH

In accordance with Section 9.2.1 of the Interim Final RFI Guidance document (EPA 530/SW-89-031), Ortho will conduct this investigation in a phased approach with respect to contaminant characterization. Investigations will be conducted in order to: 1) evaluate whether or not releases have occurred at suspected source areas; 2) characterize the degree and extent of contamination; 3) evaluate the potential pathways of contaminant migration and routes of exposure; 4) perform a baseline human health risk assessment; and 5) collect the necessary data for the development of a Corrective Measures Study (CMS), if necessary.

By conducting the RFI in a phased approach, the different sampling objectives at various source areas will be met. Sampling for determination of the presence or absence of a release will be conducted in areas of historical release. In such areas, if this investigation indicates evidence of contamination above remedial standards, such information would trigger the need for a subsequent phase of delineatory sampling. Detailed descriptions of the investigative activities that will be performed as part of this general technical approach are provided in Sections 3.2 and 3.3 of this RFI Work Plan Addendum.

This RFI Work Plan Addendum will be implemented as two (2) primary tasks: Task 4 - Supplementary RFI Activities; and Task 5 - Preparation of Revised RFI Report. This task structure is based on Attachment II of Ortho's HSWA Permit. Task 4 will consist of three subtasks. Task 4.1 will include preparatory activities necessary for the RFI, such as mobilization of subcontractors and procurement of any necessary permits. The review of existing literature and facility files as described in Section 3.1.2, and preparation of the revised plot plan as described in Section 3.1.1 will also be conducted during Task 4.1. Task 4.2 will consist of all field work described in Sections 3.2 and 3.3 of this Work Plan Addendum. Task 4.3 will consist of the Risk Assessment as described in Section 3.4. Task 5, Preparation of Revised RFI Report, will be performed as described in Section 3.5 herein.

2.2 SCHEDULE

The RFI field effort and data evaluation work will be completed within 21 weeks from the date of the EPA's approval of this RFI Work Plan Addendum. Figure 2-1 is a bar-chart schedule of the activities defined in this RFI Work Plan Addendum, up through a proposed meeting with EPA and NJDEP to review the Phase I results. The schedule will commence immediately upon receipt of EPA approval of the RFI Work Plan Addendum.

2.3 PROJECT TEAM ORGANIZATION AND PROJECT MANAGEMENT

This section details McLaren/Hart's overall approach to program management and describes the organization and structure for providing an effective, responsive project team as well as the appropriate level of technical resources, project management controls, Quality Assurance/Quality Control (QA/QC) and data management. A project organization chart is provided as Figure 2-2. The duties of key project team members are discussed below. Detailed project team resume profiles for all McLaren/Hart project team members presented on Figure 2-2 are included in Appendix I of this RFI Work Plan Addendum.

2.3.1 Overall Management Approach

McLaren/Hart's overall approach on this project is to provide strong program level management and controls as well as responsive, cohesive and technically competent project level support to Ortho's Project Manager.

Mr. Charles Elmendorf is the Principal-In-Charge and overall Project Team Leader and will be responsible for all senior level technical and management issues. Mr. Elmendorf has fourteen years experience working on complex environmental remediation and investigation programs. He will assume overall responsibility for the timely completion of all specified tasks, and will have accountability to Ortho for the successful completion of the remedial program. Mr. Elmendorf will provide overall QA/QC evaluation of each aspect of this project.

Mr. Thomas E. Rodriguez will provide technical support throughout the duration of the project. Mr. Rodriguez has been selected for this position because of his extensive RCRA Corrective Action experience, particularly in EPA's Region II. Mr. Rodriguez is a Certified Professional Geologist with the American Institute of Professional Geologists and has over 12 years of professional experience.

Mr. Richard LoCastro will function as Project Manager for the implementation of the RFI Work Plan Addendum. Mr. LoCastro, a Certified Professional Geologist with 8 years experience, will provide a direct point of contact with Ortho's project manager. Mr. LoCastro is an experienced manager with a strong geoscience background and extensive experience in hazardous waste site characterization. Mr. LoCastro will be responsible for the technical and management performance of the project team. Specific roles and responsibilities will include:

(1) coordination with Ortho's project manager,
(2) technical efforts direction,
(3) oversight/coordination with key project team members,
(4) project specific problems and issues resolutions,
(5) development and monitoring of cost control measures,
(6) planning and scheduling,
(7) coordination with McLaren/Hart's Principal-In-Charge, and
(8) attendance at all client/agency meetings.

The key project team members will be responsible for the technical implementation of the RFI Work Plan Addendum. Mr. Daniel Baldwin, an associate geoscientist with McLaren/Hart, will supervise technical implementation of activities described in section 3.3.1. Mr. Baldwin has over 3 years of experience in hazardous waste site characterization. Mr. Baldwin will also serve as Field Team Leader and Site Safety Officer. As Field Team Leader, Mr. Baldwin will manage on-site implementation of the RFI Work Plan Addendum, will provide coordination and direction of McLaren/Hart's field team and subcontractors, and will address specific on-site issues through consultation with the Project Manager. As Site Safety Officer, Mr. Baldwin will be responsible for all health and safety activities and has authority to make all health and safety-related decisions. Mr. Baldwin will report directly to the Project Manager, but will also interface with the Health and Safety Manager and other project staff to track the effective application of these portions of the RFI Work Plan Addendum.

Mr. Charles Harman will supervise the technical implementation of the Risk Assessment under Task 4.3. Mr. Harman has a Master's Degree in Biology and a Bachelor's Degree in Wildlife Ecology. He has performed numerous risk assessments in support of RCRA and CERCLA projects in EPA Region II.

Mr. Marc Cicalese will serve as the Project Engineer for the project and will be responsible for the engineering aspects associated with the investigation and subsequent design of remedial applications. Currently, Mr. Cicalese is a supervising engineer in the Warren, New Jersey office with 8 years of experience and is responsible for managing groundwater and soils investigation/remediation projects, wastewater treatment, engineering, design, and construction. He has extensive experience in hazardous waste site characterization, including the design of remedial strategies for VOC removal from saturated and unsaturated soils and groundwater.

Ms. Alison DiPasca is the Health and Safety Manager for the Warren, New Jersey office. She will be ultimately responsible for adherence to the Health and Safety Plan (HASP) included with this RFI Work Plan Addendum. Ms. DiPasca will delegate responsibility for on-site implementation of the HASP to Mr. Baldwin who, as described above, will function as Site Safety Officer.

Mr. Donald Anne' will be the project QA officer. As project QA officer Mr. Anne' will be responsible for data validation and review of field and laboratory data for compliance with QA objectives (precision, accuracy and completeness criteria) as stated in the DCQAP. Mr. Anne' has over 17 years combined experience as a bench chemist and geoscientist, and has performed this function on numerous RCRA and CERCLA projects.

2.3.2 Subcontractor Support

McLaren/Hart will utilize the subcontractors listed below for laboratory analysis, geotechnical analysis, excavation and surveying. All other activities will be performed using in-house services. All subcontractor activities will be supervised by the McLaren/Hart field team. On-site communication and direction of subcontractors will be provided by the Field Team Leader. Communication with subcontractors at the headquarters level will be performed by the Project Manager when appropriate.

Activity	Subcontractor
Laboratory Analysis	Envirotech Research Inc. Laboratories Edison, NJ
Geotechnical Analysis	Paulus, Sokolowski & Sartor Warren, NJ
Surveying	Zenith, P.C. Belle Mead, NJ
Excavation	Don Longo Inc. Chester, NJ

3.0 SUPPLEMENTARY RFI ACTIVITIES

3.1 FACILITY BACKGROUND

3.1.1 Preparation of Revised Plot Plan

This task will be conducted in response to EPA's Attachment A comments 1.a. and 1.b. on page A-1 and h. and i. on page A-2.

The plot plan of the Ortho facility and property that was provided in the June 30, 1993 Draft RFI Report will be revised to include the following information: property boundaries; a key indicating the general operations in each building; the owners of adjacent properties; the land usage at adjacent properties; the locations of subsurface utility lines; and, the locations of all solid waste management units (SWMUs). All of the sampling locations and new monitoring well locations will be surveyed by a NJ licensed land surveyor and plotted on the plot plan. Previous sampling locations will also be shown on the plot plan. The revised plot plan will be prepared at an approximate scale of 1 inch = 50 feet and will be signed and sealed by a licensed NJ Professional Engineer (PE). The scale of the map may be reduced slightly, if necessary, so that the entire site can be depicted on one plate-sized drawing.

3.1.2 Review of Existing Information and Facility Files

This task will be conducted in response to EPA's Attachment A comments 4 on page A-2 and C.2, C.3 and C.6 on page A-13.

In response to several of EPA's comments on the June 30, 1993 Draft RFI Report, a more extensive review of facility information will be conducted so that the EPA-requested information can be provided in the Revised RFI Report. The following issues will be included in the file review: Ortho's past and present permits, facility operations within each building, information about local populations and prevailing wind direction.

3.2 ENVIRONMENTAL SETTING

3.2.1 Hydrogeology

3.2.1.1 Bedrock Core Logging and Fracture Zone Correlation

This task will be conducted in response to general comments GC-3, GC-8 and page specific comment PS-26.

Bedrock coring will be conducted at the proposed locations of the two (2) deep bedrock monitoring wells in the vicinity of the former Southwest Leach Field, as depicted in Figure 3-1. The installation of the monitoring wells is further discussed in Section 3.3. The bedrock coring procedures are presented in the Data Collection Quality Assurance Plan in Section 4.0. The bedrock at each location will be cored from an approximate depth of 15 feet to 80 feet. The coring runs will be conducted over five (5) to ten (10) foot intervals and the rock cores will be logged in the field by a McLaren/Hart geologist.

The Rock Quality Designation (RQD) of each rock core will be determined. The RQD represents a modified form of recording rock core recovery and indicates the degree to which the bedrock is fractured. RQD is defined as:

$$\%RQD = 100 \times \frac{\text{length of core in pieces 4" and larger}}{\text{hole length actually drilled}}$$

The RQD is determined by totaling the lengths of core four (4) inches and longer, while differentiating between natural breaks (joints, open bedding planes, etc.) and breaks caused by drilling. Drilling breaks are not included as breaks when measuring core lengths for determination of RQD. Natural breaks in the core are distinguished by the presence of weathering products, secondary deposits, dullness and rounding produced by solution and/or slickensides.

The fracture zones identified from the core logging will be illustrated on geologic cross-sections in an attempt to correlate fracture zones across the site. The bedrock coring results from the previous RFI work conducted by Dames & Moore will also be shown on the geologic cross-sections.

3.2.1.2 Step-Rate Pumping Tests at Bedrock Well Pairs

This task will be conducted in response to general comment GC-3, page specific comment PS-11, PS-15 and PS-26.

Step-rate pumping tests will be conducted at bedrock monitoring wells MW-28D, MW-29D and MW-30D, all of which are the deep bedrock wells of the well pairs. The objectives of the step-rate pumping tests are to: 1) determine the specific capacity and approximate yield of the wells; and 2) determine if there is a hydraulic connection between the shallow and deep bedrock wells.

The step-rate pumping test at each bedrock well will be conducted in the following manner. A submersible pump will be lowered at or within a few feet from the bottom of the well. A pressure transducer will be lowered into the well at a depth just above the top of the pump in order to measure water level changes during the duration of the test. If necessary, a small diameter pipe will be lowered into the well to facilitate the collection of water level measurement data through the pipe with the pressure transducer and also with an electronic water level indicator. The shallow bedrock monitoring well at each pair will also be monitored with an electronic water level indicator. The pressure transducers will be connected to a HERMIT data logger. The data logger will be programmed to record water level measurements at a high speed logarithmic frequency for the first two (2) minutes, and at a linear frequency of every two (2) minutes thereafter.

Based on the short-term pumping test conducted at deep bedrock monitoring well MW-26, the estimated yield for the bedrock wells is approximately 15 to 20 gallons per minute (gpm) or greater assuming that these wells intersect the same system of fracture zones. Dames & Moore's short-term pumping test (22 minutes) of MW-26 resulted in 44% of the available drawdown while pumping at 12 gpm. The proposed step-rate pumping tests will be conducted at four (4) pumping rates (steps), starting at the lowest rate and increasing successively to the highest rate, with each step lasting a duration of approximately one (1) hour. The estimated pumping rates are 5, 10, 15 and 20 gpm, although the pumping rates may be modified in the field depending on the actual yields of the wells. Groundwater generated during the pumping tests will be containerized until appropriate arrangements can be made for the disposal of the water.

3.2.1.3 Water Level Monitoring in Deep Bedrock Wells

This task will be conducted in response to general comment GC-6.

A general evaluation of the potential influence of off-site pumping wells on groundwater elevations in wells at the site will be investigated by a week long water level monitoring program. Water level fluctuations in deep bedrock monitoring wells MW-24, MW-28D, MW-29D and MW-30D will be measured with Telog dataloggers at a frequency of every 30 minutes for a period of at least seven (7) days. The data will be downloaded to a computer so that hydrographs can be prepared to illustrate the groundwater level fluctuations. The hydrographs and a discussion of the groundwater elevation fluctuations will be presented in the Revised RFI Report.

3.2.1.4 Constant Rate Pumping Test

This task will be conducted in response to general comment GC-3 and page specific comments PS-11, PS-15 and PS-26.

A constant rate pumping test will be performed on one (1) of the deep bedrock monitoring wells to determine the hydraulic properties of the deep bedrock aquifer and to further evaluate the connection between the shallow and deep bedrock water-bearing zones. The results of the step rate pumping tests will be used to select a deep bedrock monitoring well for use as the pumping well during the test. The hydraulic properties computed from the pumping test analysis will be used in the evaluation of groundwater flow rate and contaminant fate and transport at the site. The pumping test will incorporate three (3) periods of water level measurements in the pumping well and surrounding observation wells: background water level monitoring, pumping test monitoring and recovery test monitoring. Water levels will be measured in four (4) monitoring wells (observation wells) at a frequency of every 30 minutes for a seven (7) day period immediately before the initiation of pumping. In addition, background water level measurements will be recorded in the pumping well and in all of the observation wells for a two (2) day period prior to starting the pumping test. The water levels will be measured with a combination of Insitu HERMIT dataloggers and transducers and Telog dataloggers. The purpose of the background measurement period will be to identify trends in groundwater elevations and potential interferences due to pumping sources.

Readings from an on-site barometer and rain gauge will be recorded periodically throughout the entire pumping test, starting from the background period and ending with the recovery period, so that any influences of barometric pressure or rainfall can be accounted for in the evaluation of pumping test data.

A submersible pump will be lowered into the pumping well in advance of the pumping test. A small diameter pipe may also be lowered into the pumping well to facilitate the measurement of water levels. Discharge from the pumping well will be monitored with an in-line totalizer flow meter at regular intervals throughout the test. Constant rate discharge will be maintained within five (5)to ten (10) percent. Arrangements for wastewater disposal will be made in advance of mobilization for the pumping test task. Groundwater sampling results from the selected pumping well will be used to obtain approval from the local POTW for discharge of the groundwater generated during the pumping test. If approval cannot be obtained, then alternative arrangements will be made.

Water levels will be measured in the pumping well and in selected observation wells according to a logarithmic frequency during the pumping test so that sufficient early time drawdown data can be recorded. As the pumping test proceeds, the water level measurement frequency will be reduced to approximately once every thirty (30) minutes to one (1) hour. The pumping test will last for a period of 24 to 48 hours depending on the response of the aquifer to pumping. If steady state conditions are achieved in the pumping well after 24 hours, then the pumping test will be terminated. The recovery period will begin the moment pumping ceases, and will last for a 24 hour period. The data loggers will be "stepped" so that the recovery data can also be recorded at a logarthmic frequency.

All of the background, pumping and recovery period water level measurement data will be downloaded from the dataloggers to a computer. After applying any necessary corrections to the data, the data will be analyzed with the computer program AQTESOLV to compute the hydraulic properties of the aquifer. Hydrographs will also be prepared to illustrate the background water level conditions, the drawdown due to pumping and the subsequent recovery of the water levels after the termination of pumping.

3.2.1.5 Groundwater Flow Modeling

This task will be conducted in response to general comments GC-3 and GC-8, and page specific comments PS-19 and PS-26.

The aquifer properties determined from the pumping test will be incorporated into a groundwater flow model that will be developed for the site. The groundwater flow model will be used to re-create a hydraulic head distribution at the site under both natural conditions (non-pumping) and stressed conditions (pumping). An appropriate model will be selected after evaluating the data generated from the RFI Work Plan Addendum investigation. The results from the groundwater flow modeling task will be used to support a fate and transport model as discussed in Section 3.3.2.3.

3.2.2 Soils

3.2.2.1 Determination of Physical Properties

This task will be conducted in response to EPA's Attachment A comments c.ii and c.iv on page A-6 and Comment 2 on page A-8.

Soil samples will be collected for determination of the following physical properties: grain size analysis, total organic carbon (TOC), permeability, pH, bulk density, porosity and moisture content. Soil samples will be collected for grain size analysis from two separate locations in the vicinity of the Northeast Leach Field, since soil samples were previously collected from a location near the Southwest Leach Field during the previous field investigation. A total of three (3) soil samples will be collected for determination of pH and TOC from across the site: one (1) at the Northeast Leach Field, one (1) at the Southwest Leach Field and one (1) at a location midway between the two leach fields. A Shelby tube will be driven at one (1) location in the Northeast Leach Field and at one (1) location in the Southwest Leach Field and the undisturbed soil samples will be collected for determination of permeability, bulk density, porosity and moisture content. at _____ depth?

The infiltration rate will be measured at two (2) sampling locations across the site using a double-ring infiltrometer in accordance with ASTM Method D 3385-88.

~~3.3 CONTAMINANT CHARACTERIZATION~~

[See revised text beginning on page 3-10]

~~3.3.1 Soil~~

~~3.3.1.1 Test Borings in Northeast Leach Field Area~~

~~This task will be conducted in response to general comment GC-7.~~

~~Previous soil sampling activities conducted in the Northeast Leach Field Area failed to provide conclusive evidence regarding the precise location of the former leach field. In addition, EPA commented that the soil samples were not collected from a deep enough interval in this area to confirm that no residual contamination remained at the interface between the overburden and the bedrock. As a result, eight test borings are proposed in the Northeast Leach Field Area in an attempt to: 1) identify the location of the former leach field; and 2) characterize the quality of soil at the base of the overburden in the vicinity of the leach field.~~

~~Two site drawings were located by ODSI and reviewed by McLaren/Hart to assist in the identification of the leach field locations. A review of a 1956 Ortho Pharmaceutical Corporation, Engineering Department drawing entitled, "Evaporation and Percolation Facilities" indicated the location of the Southwest Leach Field and a sewer line that extended between manholes associated with the Northeast and Southwest Leach Fields. The Southwest Leach Field was in approximately the same location as depicted on previous site maps that were included in the June 30, 1993 Draft RFI Report. The Northeast Leach Field was not shown on the drawing. A second site drawing prepared by ODSI on October 4, 1988 and entitled "Master Site Plan for EPA", showed the locations of both the Northeast and Southwest Leach Fields. Although the Southwest Leach Field was in approximately the same location as previously illustrated, the Northeast Leach Field was located in an area further north than shown on figures in the Draft RFI Report.~~

~~The proposed boring locations in the vicinity of the Northeast Leach Field are shown in Figure 3-1. Three borings will be drilled in the area north of the previously depicted location of the leach field to determine if the 1988 "Master Site Plan for EPA" drawing is in fact an accurate representation of the former location of the leach field. At EPA's request, several borings will be advanced in the area between monitoring wells MW-21 and MW-27, because water level measurements from the shallow bedrock wells indicated an apparent groundwater mound, suggesting that the actual leach field location may be further south. Test borings will also be drilled in the previously depicted location of the leach field so that soil samples can be collected at an appropriate depth interval at the base of the overburden. Test borings will be drilled first in the suspected northern location of the leach field to~~

~~determine if the 1988 "Master Site Plan for EPA" drawing is accurate. If test borings in this area confirm the location of the Northeast Leach Field, then the other borings may be eliminated. The area of the former Southwest Leach Field was identifiable by two to four-inch diameter drainage stone that was present at a depth of two to six feet below grade. None of the borings previously drilled in the vicinity of the Northeast Leach Field have encountered comparable drainage stone.~~

~~The test borings will be drilled with hollow-stem augers and soil samples will be collected with a three-inch diameter split-spoon sample tube. Split-spoon soil samples will be collected continuously to refusal and will be field screened with a photo-ionization detector (PID) or a flame ionization detector (FID). The soil sample indicating the highest PID/FID reading and the deepest soil sample of the boring (preferably immediately above bedrock) will be collected for analysis of target compound list (TCL) volatile organic compounds (VOCs). If no PID/FID readings are recorded, then only the deepest soil sample collected from the interval above weathered bedrock will be submitted for analysis.~~

~~3.3.1.2 Test Borings Along Sewer Line~~

~~This task will be conducted in response to page specific comments PS-4 and PS-31.~~

~~Eight test borings will be drilled along the distance of the sewer line extending from the manhole at the Southwest Leach Field to the manhole at the Northeast Leach Field. The approximate spacing of the test borings will be 85 feet. The test boring and split-spoon sampling procedures will be the same as referenced in Section 3.3.1.1. One soil sample will be selected for laboratory analysis of TCL VOCs based on field screening with a PID/FID. If no PID/FID readings are recorded, then the soil sample at the 4 to 6 foot depth interval will be selected for analysis since the depth of the sewer line is believed to be at approximately 4 feet. The proposed test boring locations along the sewer line are shown in Figure 3-1. A summary of all the proposed samples and analytical parameters is presented in Table 3-1.~~

3.3.1.1 Northeast Leach Field Area

Previous soil sampling activities conducted in the Northeast Leach Field Area failed to provide conclusive evidence regarding the precise location of the former leach field. A review of historical facility drawings suggests that, unlike the Southwest Leach Field, drainage stone does not appear to have been used in the construction of the Northeast Leach Field. Furthermore, the review of historical facility drawings indicates that the Northeast Leach Field was probably operated during the period between 1956 and 1966, in contrast to the 1956-1971 period reported in Dames & Moore's June 30, 1993 Draft RFI Report. It appears that in 1966, the discharge pipe for the Northeast Leach Field was plugged and a new sewer line was constructed to redirect flow to the Southwest Leach Field.

In an attempt to determine the impact of the Northeast Leach Field on the underlying soils, several actions will be undertaken. First, the manhole associated with the Northeast Leach Field will be opened and visually inspected by McLaren/Hart under the supervision of EPA or NJDEP. At the time that the manhole is opened, the head space in the manhole will be monitored with an Organic Vapor Meter (OVM), equipped with a photo-ionization detector (PID). Second, a test pit will be excavated in the areas of the discharge pipes to allow a visual inspection of the leach field and surrounding soils at the points of discharge.

A minimum of four (4) soil samples will be collected from locations at the point of discharge and from the area around the leach field for analysis of Priority Pollutant (PP) volatile organic compounds, including calibration for total xylenes and acetone, plus a library search of 10 tentatively identified compounds (VOC+10). The collection of soil samples will be biased to areas of visual staining and/or elevated PID readings. One soil sample will also be selected for analysis of PP semi-volatile organic compounds (semi-volatiles) and PP metals (metals). This sample will be collected from the location indicating the greatest potential for impact based on field observations and PID readings.

Mobile Lab possible?
In field

The soil samples will be shipped to Envirotech Research, Inc. (Envirotech) laboratory of Edison, New Jersey, rather than the laboratory (American Environmental Network, Inc.) specified in the June 6, 1995 Draft RFI Work Plan Addendum. The listing of Envirotech as the new laboratory has also been incorporated into a revised page for Section 4.0. If a rapid turn around time is needed for soil sampling analytical results, then soil samples scheduled for analysis of VOCs and/or Semi-VOCs may be analyzed by McLaren/Hart's NJDEP-certified mobile laboratory (Certification No. 21002).

One (1) soil sample will also be collected for analysis of grain size, pH and total organic carbon (TOC). The sample will be collected from native material in an area of the test pit that does not exhibit any indications of impact from the leach fields, so that representative values of pH and TOC from native material can be obtained. The proposed sampling and analysis for each area of concern are summarized in Table 3-1.

If VOCs are detected in the soil samples collected from the Northeast Leach Field at concentrations exceeding the NJDEP Soil Cleanup Criteria, then additional delineation soil sampling will be conducted. An expedited site characterization program, utilizing a drill rig and/or Geoprobe for test borings, and McLaren/Hart's NJDEP-certified mobile laboratory for real time analysis, will be implemented to achieve the delineation of potential VOC concentrations in soil relative to the NJDEP Soil Cleanup Criteria. Previous work at the site has indicated the presence of shallow weathered bedrock within several feet of the ground surface in many areas of the site. The proposed soil sampling program will be dependent on the subsurface conditions encountered in the area of the Northeast Leach Field. The approximate area of proposed soil sampling locations is shown in Figure 3-1. The location of the Northeast Leach Field is also depicted on Figure 3-1.

3.3.1.2 Southwest Leach Field Area

Although soil sampling was conducted previously by Recon Systems, Inc. in the Southwest Leach Field Area, some concerns were raised by EPA about the precise locations of test borings, and additionally, about the quality of the data. In an attempt to determine the impact of the Southwest

Leach Field on the underlying soils, several actions will be undertaken. The manhole associated with the Southwest Leach Field is no longer visible, and appears to have been paved over. The first action proposed is the attempted location of the manhole by estimating its position relative to the two manholes associated with the Northeast Leach Field and Leach Field Sewer Line. A metal detector may also be used to aid in locating the covered manhole.

If the manhole associated with the Southwest Leach Field Area can be located, then it will be opened and visually inspected by McLaren/Hart under the supervision of EPA or NJDEP. At the time that the manhole is opened, the head space in the manhole will be monitored with an OVM, equipped with a photo-ionization detector (PID). A test pit will be excavated at the estimated location of where the pipe from the manhole discharges to the leach field to allow a visual inspection of the soils at the point of discharge.

A minimum of four (4) soil samples will be collected from locations at the point of discharge and from the area of the leach field for analysis of VOC+10. The collection of soil samples will be biased to areas of visual staining and/or elevated PID readings. One (1) soil sample will also be selected for analysis of semi-volatile organic compounds and metals. This sample will be collected from the location indicating the greatest potential for impact based on field observations and PID readings. The soil samples will be shipped to Envirotech laboratory unless a rapid turn around of analytical results is desired, in which case, the soil samples for VOC and semi-volatiles analysis will be analyzed by McLaren/Hart's NJDEP-certified mobile laboratory.

If VOCs are detected in the soil samples collected from the Northeast Leach Field at concentrations exceeding the NJDEP Soil Cleanup Criteria, then additional delineation soil sampling will be conducted. An expedited site characterization program, utilizing a drill rig for test borings and McLaren/Hart's mobile laboratory for real time analysis, will be implemented to achieve the delineation of potential VOC impacts to the soil relative to the NJDEP Soil Cleanup Criteria. Previous work at the site has indicated the presence of shallow weathered bedrock within several feet of the ground surface in many areas of the site. The proposed soil sampling program will be dependent on the subsurface conditions encountered in the area of the Southwest Leach Field. The approximate area of proposed soil sampling locations is shown in Figure 3-1. The location of the Southwest Leach Field is also depicted on Figue 3-1.

One (1) soil sample will also be collected for analysis of grain size, pH and total organic carbon (TOC). The sample will be collected from native material in an area of the test pit that does not exhibit any indications of impact from the leach fields, so that representative values of pH and TOC from native material can be obtained. The proposed sampling and analysis for each area of concern are summarized in Table 3-1.

3.3.1.3 Leach Field Sewer Lines

The Northeast and Southwest Leach Fields are connected by a six (6) inch diameter vitrified clay pipe that extends across Ortho's paved employee parking lot as shown in Figure 3-1. A facility drawing could not be located that shows the details and layout of the sewer line extending from the facility to the Northeast Leach Field. However, the estimated location of this line, depicted in Figure 3-1, is based on the locations where the sewer line is believed to have originated in Buildings G and J, in relation to the location of the manhole at the Northeast Leach Field.

A video survey is recommended as an initial step in the proposed investigation of the leach field sewer lines to determine if there are any breaches that would signify potential points of release along the lines. A test boring program, rather than test pits, is proposed to investigate potential impacts to soil in the area of the sewer line,

1) because of the active paved parking lot overlying most of the sewer line; and ,
2) because the leach field sewer lines are no longer active.

In the area between the leach fields, approximately 9 borings will be drilled along the sewer line to comply with EPA's recommended frequency of one (1) sample per 80 feet of line. Because the actual sampling locations will be biased based on the results of the video survey, the sampling frequency represents a total minimum number of samples that will be collected along the sewer line, rather than the collection of samples at a predetermined spacing of 80 feet. The selection of test boring locations will also take into consideration adequate sampling coverage along the entire extent of the sewer line that extends between the manholes of the (2) two leach fields.

A large portion of the sewer line that extends from the Northeast Leach Field manhole to the facility is located in an area of the site where there are numerous utility lines as shown on Figure 3-1. In this area of the site (immediately west of Buildings G and J), there are several subsurface water lines, an electric line, an air supply line and a storm sewer line. Because of the hazards associated with a subsurface investigation in this area, no test borings are proposed along this segment of the sewer line. Approximately four (4) test borings will be attempted along the remaining portions of the sewer line to determine if there have been any impacts to the surrounding soil. An overhead electric line in the area may also affect the selection of locations for the test borings.

Soil samples will be collected from approximately six (6) inches below the sewer line invert by use of a split-spoon sampler. If necessary, a Geoprobe may be used for the collection of soil samples in areas of limited access. The soil samples will be analyzed by McLaren/Hart's mobile laboratory, or sent to Envirotech Laboratory for analysis of VOC+10. If VOC-impacted soils are identified in the field from the soil samples collected, then the extent of VOCs in the soil may be determined by the advancement of additional borings and through the analysis of soil samples by McLaren/Hart's mobile laboratory. One (1) soil sample will also be selected for analysis of semi-volatile organic compounds and metals. This sample will be collected from the location indicating the greatest potential for impact based on field observations and PID readings.

Previous work at the site has indicated the presence of shallow weathered bedrock within several feet of the ground surface in many areas of the site. The proposed soil sampling program will be dependent on the subsurface conditions that are encountered. If weathered bedrock is encountered at a shallow depth, it may not be possible to advance test borings to the invert elevation of the former sewer line. The approximate areas of proposed soil sampling locations, as well as the location of the Leach Field Sewer Line, are shown in Figure 3-1.

3.3.1.4 Chloroform in Monitoring Well MW-20

Chloroform has been detected consistently at elevated concentrations in monitoring well MW-20, located south of Building J. The absence of elevated chloroform concentrations in shallow monitoring wells MW-14, MW-21 and MW-27, located south of MW-20, suggests that the elevated chloroform concentrations are localized in the area of MW-20. The absence of elevated chloroform concentrations in down-gradient deep monitoring wells MW-26, MW-28D, MW-29D and MW-30D also indicates that the elevated chloroform concentrations in MW-20 appear to be localized to shallow zone.

In an attempt to determine the source of the chloroform in MW-20, a review of facility operations was conducted, the area around MW-20 was inspected, and past and present Ortho employees were interviewed to obtain information about the usage of chloroform at the site. An important objective of these efforts was to focus the proposed source characterization investigation on specific areas of concern. In general, the results of the facility operations review and employee interviews did not indicate any likely explanation of the existence of chloroform in monitoring well MW-20.

From the review of facility operations and employee interviews, it was learned that chloroform is handled in relatively small amounts in the manufacturing process in Building G. The manufacturing division in Building G receives the chloroform in 5 gallon stainless steel containers. According to Ortho personnel, the chloroform is used in one particular process approximately one to two times per year, every three years. The waste chloroform is combined with methanol and acetone waste, and transferred by above-ground piping from Building G and through Building J before discharge into the 5000 gallon waste methanol/acetone tank, located east of Building J.

had chloroform also -

From at least 1968 to 1981, chloroform was also used for euthanasia of laboratory animals used for research at the facility. The usage of chloroform for this purpose presumably occurred in the research division (Building K) or animal storage area (Building F).

The potential usage of chloroform in the refrigeration systems was also investigated. However, according to facility personnel, there is no indication that chloroform was ever used for this purpose.

During the inspection of the area around monitoring well MW-20, a previously unknown monitoring well (MW-MT) was discovered by McLaren/Hart at a location west of MW-20, as shown on Figure 3-1. Upon further inquiry, McLaren/Hart learned that MW-MT had been installed under the direction of Dames & Moore as part of an investigation of two former 4800 gallon methanol underground storage tanks (UST). The estimated locations of the former methanol USTs have been added to Figure 3-1, based on the locations depicted in Dames & Moore's June 19, 1992 Site Assessment Plan Report - Methanol Tank Closure. A copy of the Dames & Moore report is provided in Appendix IX.

From the information obtained during the site inspection and review of facility operations, McLaren/Hart recommends the sampling of monitoring well MW-MT for VOC+10, as a first step in the investigation of a potential source area in the vicinity of MW-20. The analytical results from the sampling of MW-MT may indicate whether the potential source of the chloroform extends to the west of MW-20.

Because no obvious source of the chloroform was discovered in the area around MW-20, a test boring program will be conducted in the area of Building J and MW-20 to determine if a possible historical discharge or possible historical poor housekeeping practice in the area around Building J could be a source of the chloroform. McLaren/Hart did not learn of any improper disposal practices involving chloroform during the review of facility operations. However, because chloroform appears to have been used and/or transferred through Buildings G and J, the area outside of Building J will be investigated to determine if any unknown historical discharges of chloroform occurred in this area. Two (2) other potential sources of the chloroform in the area around MW-20 are the north-south trending section of the leach field sewer line and the process/sanitary sewer system which will be investigated as discussed in Sections 3.3.1.3 and 3.3.1.5, respectively.

Six (6) test borings will be attempted with a Geoprobe at the locations immediately south of Building J, as shown in Figure 3-1, to investigate a potential source of chloroform. If the analytical results from the sampling of MW-MT indicate the presence of elevated chloroform concentrations, then additional borings may be advanced in the area west of MW-20, or the area may be addressed by the proposed test pits along the process/sanitary sewer line.

The proposed test borings along the north-south trending section of the leach field sewer line (Section 3.3.1.3) and the proposed test pits along the process/sanitary sewer line (Section 3.3.1.5) will also assist in the investigation of a chloroform source. The Geoprobe test borings south of Building J will be advanced to refusal (estimated at <10 feet), and each soil sampling tube will be logged, visually inspected and field screened with an 11.2 ev PID. Soil samples will be selected for shipment to either Envirotech or McLaren/Hart's NJDEP-certified mobile laboratory for analysis of VOC+10. The soil samples selected for analysis will be from the 6-inch interval indicating the highest potential for impact based on a visual inspection and PID readings. If no obvious impacts are indicated based on the visual inspection and PID readings, then the soil will be collected at the 1.5 to 2.0 foot depth interval. If additional delineation sampling is warranted, then McLaren/Hart's mobile laboratory will be used to expedite the source characterization.

3.3.1.5 Process Sewer Line System

Description

The requirement for a SWMU Assessment Plan is addressed by the scope of work proposed in this section for investigating potential releases from the Process Sewer Line System. The main trunks of the Process Sewer Line System are illustrated on Figure 3-2 and the specifications of the lines are summarized in Table 3-3. The information for both the Process Sewer Line System and the former Gasoline UST is provided in Appendix VI. In addition to the process/sanitary sewer mains shown on Figure 3-1, there is also a network of process/sanitary sewer mains located within the interior of the facility. The interior sanitary sewer mains are depicted on the December 29, 1981 Ortho drawing entitled `Sanitary Sewer Mains', a copy of which is provided in Appendix VI. Due to the level of detail provided in this figure, the interior sewer mains are not illustrated on the site base map provided as Figure 3-1.

The northernmost line is an eight (8) inch diameter line constructed of cast iron that conveys process wastewater and sanitary sewer waste from Buildings A, B, C, E, G, H, M and N as shown in Figure 3-2. Prior to renovations to this line in 1995, the eight (8) inch diameter sewer line ran eastward to a manhole outside of Building H, and then at a 45 degree angle southeastward to a manhole before running eastward again off-site. As part of a previous pH equalization project for combined process/sanitary sewer wastewater, unrelated to the RCRA program, the eight (8) inch diameter line was plugged at the manhole outside of Building H, and a new eight (8) inch diameter fiberglass-reinforced plastic (FRP) pipe line was installed running south from the manhole to a new ten (10) inch diameter FRP line located southeast of Building D.

The southernmost line conveys wastewater and sanitary sewer waste from Buildings F, K, J and Q and varies in diameter and construction material as shown in Figure 3-2 and Table 3-3. A sewage lift station that is part of the process/sanitary sewer line system is located approximately 25 feet south of Building K. The sewage lift station was constructed in 1968 and is presently operational. The lift station consists of a 9 foot deep, 7.3 foot diameter, reinforced concrete tank with a capacity of approximately 2,800 gallons which forms the lower section, and a 7.5 foot deep (from grade), 7.3 foot diameter upper housing section which permits access to the pumps. The total depth of the lift station is 16.5 feet from grade. The lift station accepts process and sanitary waste from Buildings K and F. The tank and pumps are inspected on a quarterly basis, and any sludge which may form in the tank is pumped-out semi-annually, if necessary.

A four (4) inch diameter force main, assumed to be constructed of cast iron, conveys wastewater from the sewage lift station southward, before turning eastward where it runs south of Buildings F, B, E and J. The four (4) inch diameter pressure line connects to a six (6) inch diameter vitrified clay pipe (VCP) that runs southward out of Building J to a manhole, before extending eastward, and then northeastward to a manhole south of Building D. A three (3) inch diameter VCP line which originates in Building Q, connects to the six (6) inch diameter VCP line at the same manhole south of Building D.

From the manhole south of Building D, the six (6) inch diameter VCP line formerly continued eastward to a manhole before extending eastward off-site. As part of the pH equalization project in 1995, the six (6) inch diameter VCP line was re-routed to a new ten (10) inch diameter FRP line that originates at a point south of Building D, and runs eastward where it is joined by the new eight (8) inch diameter FRP line from the north. As illustrated in Figure 3-1, the ten (10) inch diameter FRP line runs to a manhole (South Diversion Vault) where it is directed to a 10,000 gallon double-wall FRP underground storage tank (UST) for pH equalization. Return wastewater from the 10,000 gallon FRP UST is pumped southward back to the 10 inch line. The amount of wastewater which is pumped to the line is controlled by a mechanical valve staged in a control vault outside the tank area. The water is pumped through the valve and into a 6 inch diameter FRP line which connects back to the 10 inch FRP. Once back to the 10 inch line, the wastewater is diverted to the two original sewer lines which run off-site. The northernmost line is an eight (8) inch diameter cast iron pipe, whereas the southernmost line is a six (6) inch diameter VCP pipe.

The abandoned six (6) inch VCP and isolated eight (8) inch cast iron line were inspected by a video survey that was conducted prior to the pH equalization project. A copy of the videotape of the on-site and off-site sewer line inspections completed to date is being provided to EPA under separate cover. The portions of the on-site and off-site sewer lines that have been videotaped to date are illustrated in Figures 3-3 and 3-4, respectively. A description of the numbering scheme for the manholes that was used at the time of the video inspections is also provided on Figures 3-3 and 3-4. A revised numbering scheme which includes the manholes on the neighboring former NAPA property has recently been adopted, as indicated in Figures 3-3 and 3-4, and in the June 3, 1996 Work Plan for Proposed Investigation of Sewer Lines on Former NAPA Property.

Description of Proposed Work

A proposed investigation of the off-site portions of the sewer line is provided in a separate work plan dated June 3, 1996, entitled 'Work Plan for Proposed Investigation of Sewer Lines on Former NAPA Property.' This work plan is currently in the process of being revised in response to comments received from EPA and NJDEP.

The proposed investigation of the on-site process/sanitary sewer line system will include the following tasks:

- clean out and inspection of the sewage lift station;
- sampling and analysis of the process/sanitary effluent;
- video inspection of the accessible exterior sewer lines; and,
- soil sampling along the exterior process/sanitary sewer lines.

A description of each of the proposed tasks is described in the following sections.

Sewage Lift Station Clean Out and Inspection

Although EPA requested that soil borings be advanced to investigate the potential impact of the sewage lift station, Ortho does not believe that borings will be effective in achieving this objective because the depth of the sewage lift station base (16.5 feet) appears to be below the depth of bedrock (generally 2 to 10 feet below grade). As an alternative, the sewage lift station will be cleaned out, inspected for cracks and/or any other potential breaches and will be photo-documented. If any cracks and/or any other breaches are identified, then Ortho recommends that the impact of the sewage lift station be evaluated during the groundwater phase of the RFI, through the installation of a shallow monitoring well. In addition, all cracks and/or breaches will be repaired as necessary, or the lift station will be replaced.

Sampling and Analysis of Process/Sanitary Effluent

Effluent at manholes MH-6 and MH-7 (see Figure 3-4) is presently sampled on a semi-annual basis for the following parameters: Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Oil and Grease, pH and cyanide. Prior to November 1, 1995, Total Petroleum Hydrocarbons (TPH) was also monitored on a semi-annual basis in accordance with Ortho's discharge permit with Somerset Raritan Valley Sewerage Authority (SRVSA). Available semi-annual effluent data obtained from Ortho during the period from April 1994 to April 1995 is summarized in a table provided in Appendix VI. The current discharge limitations and monitoring requirements stipulated by Ortho's permit with SRVSA are provided in Appendix VI.

Because there has been no recent analysis of the process/sanitary effluent for chlorinated VOCs, Ortho arranged for the sampling and analysis of the effluent at the two (2) easternmost manholes (MH-6 and MH-7) on the Ortho property once per week for four (4) successive weeks during June 1996. Each of the four (4) effluent samples from each manhole will be collected on a different day of the week at a different time to obtain data representative of various discharge periods, rather than a single isolated sampling event. The effluent samples will be collected by Recon Systems, Inc. and analyzed by Accutest Laboratory for chlorinated VOCs by EPA Method 601. Effluent samples for one event will also be analyzed for VOCs+10 and Semivolatiles+25.

Video Survey of Sewer Lines

As part of the proposed investigation of the on-site process/sanitary sewer system, the videotape of on-site sewer line inspections will be reviewed to identify locations of potential breaches. The sections of the sewer line that have already been inspected by a video survey are illustrated in Figure 3-3. In addition, a video survey will be conducted of the active, southernmost, six (6) inch diameter sewer line between the manholes south of Building J and C. An attempt will also be made to video inspect the three (3) inch diameter sewer line originating in Building Q. The four (4) inch diameter pressure line running south of Building J cannot be video inspected due to its construction specifications.

Soil Sampling Along Sewer Lines

Soil sampling is proposed at 22 locations along the process/sanitary sewer line system as shown in Figure 3-1. The actual soil sampling locations will be modified pending a review of the video survey inspection results so that locations can be biased to potential breaches along the sewer line. The proposed sampling frequency generally satisfies EPA and NJDEP's recommended frequency of one (1)sample per 80 feet of pipe length, with the exception of the section of line running south of Building K, and a section of line running to the east in the area south of Buildings B and F. The sewer lines in these areas of the site are overlain by a heavily used paved employee parking area. As an alternative to the 80 foot sampling frequency in this area, Ortho proposes that one (1) sample be collected along the approximately 150 foot section extending from the edge of the pavement southward to where the line turns eastward. Two (2) samples are proposed for the approximately 540 foot section of pressure line that also extends across the employee parking lot. Because the excavation of test pits is the method proposed for collection of soil samples along sections of active sewer lines, Ortho proposes the reduced sampling frequency in this area of the site to minimize damage and disruption to the paved employee parking lot, given the extensive sampling coverage proposed along the remaining areas of the sewer line.

The collection of soil samples will be facilitated by the excavation of test pits adjacent to active sections of sewer line, and the drilling of test borings along the abandoned sections of sewer line. The proposed excavation of test pits will be conducted in the following manner. The test pits will be excavated at locations along the sewer line where breaches, sags and/or dips are identified. The locations for test pits will also be selected to provide representative coverage along lengths of pipe where no breaches are identified, and/or where an adequate inspection of the sewer lines could not be achieved by the video survey, with the exception of the two (2) sections of pipe previously referenced. The overall objective for the selection of test pit locations will be to target potential release points along the sewer lines, while also providing sufficient sampling coverage along the entire length of the sewer line system.

The test pits will be excavated parallel to the sewer lines, and to a depth of approximately 1 foot below the bottom of the pipes, with a minimum width of 4 feet to provide a safe working area for sampling and pipe inspection. The anticipated depth of the test pits is approximately 7 feet to permit exposure of the sewer line invert. The soil/bedding material directly below the pipe will be left undisturbed to support the pipe, so that a representative soil sample may be collected. Test pits that are located adjacent to manholes will be excavated in a similar manner so that an undisturbed soil sample can be collected at the precise area of concern (ie. at locations of cracks or where mortar is absent between bricks).

Soil samples will be collected from the walls of test pit excavations using a decontaminated stainless steel hand trowel. Once the test pit has been excavated to the desired depth and adequately shored, a McLaren/Hart engineer or geoscientist will enter the excavation with all the equipment necessary for sample collection. A properly calibrated PID will be used to screen soils within the excavation to determine the presence of VOCs.

Soil samples will be collected immediately below each sewer line, perpendicular to the wall of the excavation. If the soil underlying the sewer line is composed of a silt or clay matrix, then the sample will be collected from the first six (6) inches of soil below the line. If the underlying soil is a more permeable sand, the sample will be collected from soils directly above the first confining layer or bedrock, whichever is encountered first. If any additional soils within the excavation exhibit elevated PID readings, then samples from those intervals will also be collected and submitted for analysis. If samples of soil or bedding material cannot be collected due to the presence of weathered rock, then the location will be field screened with a PID, inspected for evidence of a release and photo documented.

Test borings utilizing either a split-spoon sampler or a Geoprobe are proposed to investigate the inactive section of sewer line located in the eastern portion of the site. This section of the sewer line was replaced in 1995 as part of a pH equalization project, as previously described. No sampling is proposed along the new sections of the fiberglass sewer line that were constructed in 1995, for the purpose of investigating the process/sanitary sewer line as a SWMU. Test borings, rather than test pits, may be advanced along the inactive section of the sewer line because there is less concern over damaging a section of the abandoned line while attempting to sample within two (2) feet of the line. Soil sampling locations are depicted in Figure 3-1. However, the actual locations will likely be modified pending a review of the video survey inspection results.

All soil samples will be analyzed for VOC +10 by McLaren/Hart's NJDEP-certified mobile laboratory or by Envirotech Research, Inc. If VOCs are detected at concentrations exceeding the NJDEP Soil Cleanup Criteria, then additional delineation sampling may be performed using McLaren/Hart's mobile laboratory. At 10% of the sampling locations, soil samples will be collected for analysis of semi-volatiles, as summarized in Table 3-1.

3.3.1.6 Building D Floor Drains

In response to EPA and NJDEP's comment regarding the absence of sanitary sewer lines in Building D, an inspection of the building was performed. McLaren/Hart also reviewed facility drawings and documents and interviewed current facility employees to obtain additional information regarding floor drains that were identified in Building D. The inspection at Building D revealed the presence of four (4) floor drains, one of which was sealed with concrete. The remaining three (3) drains were observed to be sealed with plugs at the time of inspection. Site drawings indicate that the floor drains are connected to a storm sewer which ultimately discharges to the east outfall (DSN 001). A copy of the storm sewer mains drawing (DWG# E-82-035-P) is provided in Appendix VI. A review of this drawing indicates that there are no other connections of floor drains at the facility to the storm sewer system. During the inspection, a small amount of oily residue was observed in one of the drains. The residue is likely to have originated from motor oil that may have spilled during vehicle maintenance activities that are performed in the garage. Based on the appearance of the oily residue and the connection to the storm water system, the Building D floor drains were designated as an area of concern requiring further investigation during the RFI.

In addition, McLaren/Hart reviewed the results of quarterly surface water sampling from the east outfall, which are provided in Appendix VI. Even though these results did not reveal the presence of petroleum hydrocarbons at concentrations above the detection limits, McLaren/Hart is proposing additional sampling of the sediment at the nearest sediment accumulation point at the east outfall (DSN 001), which is the discharge point of the Building D floor drains. The results of the sediment sampling will be used to determine the impact of potential releases of used motor oil to the floor drains in Building D. The sediment sample will be analyzed for total petroleum hydrocarbons (TPH), VOC+10 and Base Neutrals with a library search (BN+15). If the results of this sampling do not indicate the presence of constituents at concentrations above regulatory standards, no further action will be recommended or proposed.

3.3.1.7 Former Gasoline Underground Storage Tank

Post-excavation soil sampling results from the removal of a 550 gallon gasoline UST revealed the presence of xylene in two (2) locations at concentrations above the NJDEP Impact to Groundwater Soil Cleanup Criteria. In addition, groundwater sampling results from MW-33, which was installed to monitor perched groundwater in the vicinity of the UST excavation, revealed a total xylene concentration above the NJDEP Groundwater Quality Standard. As a result, additional sampling is recommended for adequate soil and groundwater delineation. The soil and groundwater analytical results are included in the UST Closure Report in Appendix V.

One (1) soil sample is proposed to the north of the excavation and another is proposed to the west, as illustrated on Figure 3-1, to delineate concentrations of total xylene north and west of the former UST. Soil samples will also be collected along the process sewer line which runs north of the UST excavation and to the southeast of the excavation. These borings are intended to assess potential xylene contamination in soils near the sewer line excavations, which could act as a preferred migration pathway. Soil sampling along the sewer lines may be performed in conjunction with the sampling outlined in Section 3.3.1.5, since both tasks are designed to assess impact to soils along the process sewer line.

All soil samples will be collected from test borings at depths equivalent to the soil samples collected during the post excavation activities. If field screening with a PID indicates the presence of elevated VOCs in soils at other intervals, additional samples may be collected. Soils will be analyzed for VOCs including calibration for xylenes plus a library search of 10 quantitatively identified compounds (VOC+10). If analysis of soils from the proposed sampling locations reveals the presence of VOCs at concentrations above the NJDEP Impact to Groundwater Soil Cleanup Criteria, the collection of additional soil samples may be necessary for adequate delineation. Furthermore, analytical results from soil sampling will be used to evaluate the need for additional monitoring wells to assess groundwater quality.

Another groundwater sample will be collected from MW-33 to continue monitoring xylene concentrations in groundwater in the vicinity of the UST excavation. Potential impact to groundwater downgradient of the excavation will be addressed by collecting groundwater samples from monitoring wells MW-5 and MW-10. All groundwater samples will be analyzed for VOC+10, Methyl Tertiary Butyl Ether (MTBE), Tertiary Butyl Alcohol (TBA), and lead.

3.3.2 Groundwater

3.3.2.1 <u>Deep Bedrock Monitoring Well Installation</u>

This task will be conducted in response to EPA's Attachment A comment f.i on page A-10.

Two (2) deep bedrock monitoring wells (MW-23D and MW-32) will be installed in the vicinity of the Southwest Leach Field to provide better characterization of the deep bedrock groundwater quality in this area. MW-32 will be located east-southeast (downgradient) and MW-23D will be installed upgradient of the Southwest Leach Field. Well MW-23D will be installed near existing shallow bedrock well MW-23 to form a well pair.

Each bedrock boring will be cored the entire interval of the proposed well depth (80 feet). The bedrock cores will be logged in the field by a McLaren/Hart geologist. Bedrock core logging is described in Section 3.2.1.1. Deep bedrock monitoring well installation and development procedures are provided in the Data Collection Quality Assurance Plan (Section 4).

3.3.2.2 Groundwater Sampling

This task will be conducted in response to EPA's Attachment A comments f.i and g on page A-10.

The new monitoring wells (MW-23D and MW-32) will be sampled shortly after, but no sooner than two (2) weeks after completion of well development. Groundwater samples collected from MW-23D and MW-32 will be sent to the laboratory for analysis of VOC + 10 only since groundwater sampling data collected from the 23 monitoring wells at the site over the last few years have indicated that VOCs are the predominant compounds of concern. A second round of groundwater sampling will be conducted on MW-23D and MW-32 after a minimum time period of 30 days from the first round of sampling to confirm the results. In response to EPA's comments, existing bedrock monitoring wells MW-24 and MW-26 will be sampled on one (1) more occasion for analysis of semivolatile organic compounds to provide confirmation of the non-detections recorded previously in these wells. Groundwater sampling procedures are presented in the Data Collection Quality Assurance Plan (Section 4).

3.3.2.3 Fate and Transport Modeling

This task will be conducted in response to general comment GC-8 and page specific comments PS-19 and PS-26.

The groundwater analytical results and the results of the groundwater flow modeling will be used to support the fate and transport modeling of compounds of concern in groundwater at the site. The results of the fate and transport modeling will be used to predict the rate of compound migration in groundwater at the site, and assess whether or not these compounds are reaching or could reach human and/or ecological receptors.

3.4 RISK ASSESSMENT

3.4.1 Baseline Human Health Risk Assessment

Ortho will conduct a human health risk assessment (HRA) for the site following the collection and evaluation of additional data as specified in this RFI Work Plan Addendum. The following sections provide a general outline of this HRA.

3.4.1.1 Objectives

Risk assessment, as defined by the National Academy of Sciences (NAS), is the characterization of the probability of potentially adverse health effects resulting from human exposures to environmental hazards. In essence, it is the systematic evaluation of the possible health effects posed by a particular substance or mixture of substances present in one (1) or more environmental media. The framework to quantify such adverse health effects was established by the NAS in 1983 and subsequently adopted by the the U.S. Environmental Protection Agency (USEPA). Recently, USEPA established a comprehensive policy for performing human health risk assessments. As articulated in the *Guidelines for Exposure Assessment* (1992) and in the *Guidance on Risk Characterization for Risk Managers and Risk Assessors* (USEPA memo dated Feb 26, 1992), a framework is provided for conducting risk assessments of high scientific quality and technical consistency. Four (4) basic elements are required in order to quantify health risks. These elements are:

> ***hazard identification*** (the determination of whether a particular chemical is or is not causally linked to particular health effects)
>
> ***dose-response assessment*** (the establishment of a relationship between the magnitude of exposure and the probability of occurrence of the health effects)

exposure assessment (the determination of the extent of human exposure before or after application of regulatory controls), and

risk characterization (the description of the nature and often the magnitude of human risk, including attendant uncertainty).

The objective of the risk assessment is to provide an analysis of the baseline risks at the site and determine the need for future response actions, if any. The human health risk assessment will be performed in compliance with the following USEPA guidance documents:

- OSWER Directive 9285.6-03; *Human Health Evaluation Manual, Supplemental Guidance*; USEPA, 1991
- *Risk Assessment Guidance for Superfund; Human Health Evaluation Manual*; USEPA, 1989 (RAGS)
- *Exposure Factors Handbook*; USEPA, 1989.

The goal of the risk assessment process is to gather and assess human health risk information for use in evaluating the need for corrective measures. Specific objectives of the baseline HRA are: (1) to provide an analysis of the baseline risks at the site and determine the need for future response actions, if any; (2) to provide a basis for assessing levels of hazardous substances that can remain on-site and still be protective of human health; and (3) to provide the basis for comparing potential health impacts of various remedial alternatives and technologies.

The HRA will be an analysis of the potential adverse health effects caused by hazardous substance releases from the site in the absence of any actions to control or mitigate these releases (under the assumption of no action). The HRA will focus primarily on the groundwater at the site, with a screening level evaluation of the surface soils.

3.4.1.2 Scope

The risk assessment will evaluate the potential health risks associated with exposure to site-related chemicals and provide a determination of current and potential future exposure pathways which are complete and may result in human exposures. The risk assessment will utilize data obtained through all phases of sampling. The final output of the human health risk assessment is a quantification of risks posed by the site to public health, and a characterization of the risks relative to site conditions, as well as other potential sources including site-specific background, if possible. Considering the potential for regional groundwater contamination, this final issue will be of paramount importance.

3.4.1.3 Data Evaluation

Validated data from all sampling rounds will be combined, where appropriate, for the purposes of the risk assessment. Data summary tables will present the results of the groundwater and surface soil sampling efforts which will be used to determine site-wide average concentrations for the chemicals of concern in those media. Also included will be the 95% upper confidence limit (95UCL) of the arithmetic mean of all measured values for each sample set. This value and the arithmetic mean will be used to estimate the potential health risk for the maximum exposed individual and the average exposed individual, respectively. Non-detects will be treated as 1/2 of the contract required detection limit (CRDL) for averaging, unless there is evidence to preclude the presence of a contaminant in any medium. Values measured below the CRDL but above instrument detection limits will be averaged as the values reported. Because of the amount of time necessary for data preparation and the importance of accurate data tables, McLaren/Hart would recommend that tabulation of all available data (groundwater and surface soils) begin as soon as possible.

3.4.1.4 Selection of Chemicals of Concern

The methodology used in selecting chemicals of concern to be carried through a quantitative risk assessment for the site will be consistent with that described in *Risk Assessment Guidance for Superfund (RAGS) - Volume I, Human Health Evaluation (Part A) Interim Final (December, 1989, USEPA 540/1-89/002).*

The list of chemicals of concern will include:

(1) Chemicals which were positively identified in at least one sample in a given medium (groundwater and/or surface soils), including: a) chemicals with no qualifiers attached (excluding samples with unusually high detection limits); and b) compounds detected at concentrations below practical quantitation limits;

(2) Chemicals detected at levels significantly elevated (i.e. 5 to 10 times depending on the toxicity of the compound) above levels of the same chemicals detected in associated blank samples;

(3) Inorganic chemicals detected at levels significantly elevated (i.e. 2 to 5 times) above naturally occurring levels of the same chemicals;

(4) Tentatively identified chemicals which may be associated with the site based on historical information; and/or

(5) Transformation products of chemicals demonstrated to be present.

This list may be reduced, if necessary, based on comparison with ARARs, evaluation of frequency of detection, and identification of essential human nutrients present at low concentrations.

3.4.1.5 Exposure Assessment

An exposure assessment would be conducted to estimate the magnitude of actual and/or potential human exposures to chemicals of concern present at the site. This will consist of the following four subtasks.

Identification of Potential Receptors

All human receptors which have the potential to be impacted by site-related chemicals will be identified. This will be accomplished by defining the potential for release to groundwater and surface soils, for both on-site and off-site receptors. Populations which may be impacted by releases from these media will be identified as a result of a review of the residential, occupational, and if appropriate, recreational usage patterns of the area. An analysis of current land use, potential future alternate land uses, and of subpopulations of concern will be performed.

Identification of Exposure Pathways

Complete exposure pathways will be identified as the result of an analysis of current and potential future land uses of and around the site. As previously mentioned, the groundwater pathway will be the primary focus, with a screening level approach used to assess the surface soil pathway. Potential pathways for exposure may include ingestion of groundwater, ingestion of and dermal contact with soils, and any additional exposure pathways which are identified as a result of the implementation of the RFI Work Plan Addendum.

Quantification of Exposures

Calculating Exposure Point Concentrations. Data on exposure point concentrations for all chemicals of concern will be provided for groundwater and surface soil at the site. Current Superfund

Guidance, as stated in RAGS, calls for the calculation of exposure point concentrations as the 95% upperbound confidence limit (UCL) of the arithmetic mean of all measured values. This is intended to provide a reasonable maximum concentration value for use in estimating reasonable maximum exposures (RME). It is based on the expectation that an individual exposed to chemicals at the site would be exposed to an average of all concentrations present rather than the unlikely scenario of an individual being exposed only to the highest level of a contaminant present.

Estimation of Chemical Intakes. Estimated potential intakes for each chemical of concern, and for each of the populations and potential exposure pathways will be calculated. For each pathway, the average exposure and RME (Reasonable Maximum Exposure) scenarios (utilizing the arithmetic mean and 95 UCL values, respectively) will be developed using pathway and population-specific exposure factor values. These values will be gathered from current guidance documents and site-specific information. Potential chronic daily intakes will be calculated for adult exposures to potential carcinogens and non-carcinogens, and for children exposed at this site.

3.4.1.6 Toxicity Assessment

The toxicity assessment will utilize USEPA-derived critical toxicity values [reference doses (RfDs) and slope factors (SFs)] for each chemical of concern. A brief description of the relevant toxicity information for each chemical evaluated will be included as an appendix.

The primary source of toxicity information will be the USEPA's Integrated Risk Information System (IRIS). A secondary source of information will be the most recent Health Effects Assessment Summary Tables (HEAST) published by USEPA Environmental Criteria and Assessment Office (ECAO). Chemicals for which no USEPA-published toxicity values are available will be addressed quantitatively, where reasonable alternative toxicity assessment approaches are available. Otherwise, a qualitative assessment will be performed.

3.4.1.7 Risk Characterization

The risk characterization will summarize and combine outputs of the exposure and toxicity assessments to characterize baseline risk at the site. During risk characterization, USEPA-derived toxicity information for chemicals of concern will be compared to calculated exposure levels in order to determine whether current or potential future exposures at the site pose risks to human health.

USEPA-required methodology for quantification of carcinogenic risks and non-carcinogenic health hazards will be used to determine whether there are potential human health risks posed by this site. This methodology is as follows: for potential carcinogens, the calculated CDI (chronic daily intake) is multiplied by the USEPA-derived slope factor to derive the risk, which is compared to the USEPA acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$ and the agency's risk goal of $1x10^{-6}$. For non-carcinogens, the calculated daily intake is divided by the chronic reference dose (RfD) in order to derive the hazard index, which is compared to an acceptable hazard index of 1.0. Chemicals and pathways for which potential risks are calculated to exceed these acceptable levels will be summarized. Tables will be presented which contain the calculated potential risks for all chemicals of concern found, in each medium, for each exposure scenario, and for each population considered. These tables will also present cumulative potential risks for carcinogens and non-carcinogens for each pathway and population. Where appropriate, risks will be combined across pathways.

3.4.1.8 Discussion of Uncertainties

Uncertainties associated with each component of the HRA (exposure assessment, toxicity assessment, and risk characterization) will be summarized. This is intended to provide the most complete information regarding the potential impact of these uncertainties on the HRA.

3.4.2 Environmental Assessment

An Environmental Assessment (EA) evaluates the potential risks posed to environmental receptors by chemicals of concern at the site. Specifically, the EA will address the following two investigative requirements for the site.

3.4.2.1 Endangered Species Survey

McLaren/Hart proposes to evaluate the potential for rare, threatened and endangered species to be present at the site through a search of available regulatory data bases. Contact will be made with the State Natural Heritage Data Base to determine the potential for the presence of rare, threatened and endangered plant or animal species. This will be supported by a visit to the site to confirm the possible presence or absence of a particular species.

3.4.2.2 Description of the Local Ecology

Using standard ecological evaluation techniques, a qualitative description of the local ecology of the site will be made. Based on a field visit and a review of available literature, a general understanding of the vegetative communities found on and adjacent to the site, as well as the probable faunal assemblages found there will be developed.

3.5 PREPARATION OF REVISED RFI REPORT

The Revised RFI Report will present an analysis and summary of the results of all facility investigations performed pursuant to Task IV of the HSWA Permit. This shall include all activities presently described in the Draft RFI Report and Sections 3.1 through 3.4 of the RFI Work Plan Addendum. The report will describe the nature and extent of contamination, the potential threat to human health and the environment and recommendations for future work, if any. The report will present an evaluation of the need for interim measures and/or a Corrective Measures Study (CMS).

The organizational format of the Revised RFI Report will correspond as closely as possible to the sequence of requirements contained in the HSWA Permit Attachment II, Task I: Description of Current Conditions, and Task III: RFI Work Plan Requirements. The anticipated basic outline for the report is contained in Table 3-2.

All laboratory data will be validated in accordance with appropriate protocols and presented in the Revised RFI Report both in its entirety and summarized in tables. All field and laboratory data will be presented in table, graph and/or figure format, in order to facilitate interpretation. The quantity, nature and extent of contamination will be presented. Based on these data, interpretations will be provided regarding sources of contamination and migration pathways.

4.0 DATA COLLECTION QUALITY ASSURANCE PLAN

The Data Collection Quality Assurance Plan (DCQAP) provided as Attachment 2 of Dames & Moore's August 17, 1990 Revised RFI Work Plan will be followed except where noted on the errata table provided in Table 4-1. The revisions by McLaren/Hart represent minor changes to the text and tables of the DCQAP needed to clarify general field procedures and/or equipment requirements. The only global changes to the text include all references to Dames & Moore and York Laboratories. The revised DCQAP and attached Errata Sheet are meant to provide a summary of general procedures for conducting field work for the remedial investigation. Detailed procedures for specific test borings/well installations, and soil and groundwater sampling to be conducted during this phase of work are provided in the in Section 3.0 of the RFI Work Plan Addendum. Figure numbers in the DCQAP have not been modified and do not correspond to figure numbers provided in Section 3.0 of the RFI Work Plan Addendum. The laboratory, Envirotech Research, Inc. will provide an SW-846 type data deliverable package with the analytical results.

5.0 DATA MANAGEMENT PLAN

The Data Management Plan provided as Attachment 3 of Dames & Moore's August 17, 1990 Revised RFI Work Plan will be adhered to with one (1) exception. A firm-wide quality assurance officer will not review the project files as specifically referenced in the Data Management Plan. As an alternative, a principal level scientist at McLaren/Hart will review and audit the project files on a quarterly basis. The only global changes to the text include all references to Dames & Moore and York Laboratories which should be replaced by McLaren/Hart and Envirotech Research, Inc. respectively.

6.0 HEALTH AND SAFETY PLAN

A revised Health and Safety Plan (HASP) prepared by McLaren/Hart for the RFI Work Plan Addendum investigation is provided in Appendix II of this RFI Work Plan Addendum. The HASP will be kept on-site at all times while McLaren/Hart personnel and subcontractors are engaged in field activities.

7.0 COMMUNITY RELATIONS PLAN

The Community Relations Plan provided as Attachment 5 of Dames & Moore's August 17, 1990 Revised RFI Work Plan will be followed during the implementation of the RFI Work Plan Addendum. All references to Dames & Moore should be replaced by McLaren/Hart.

Table 3-1
Proposed Sampling Summary

Area	Number of Samples	Matrix	Analytical Paramters	Analytical Method
Northeast Leach Field	4 a	Soil	PP VOCs+10	SW846 8240 or 8260
	1	Soil	PP Semi-volatiles	SW846 8270
		Soil	PP Metals	6010, 7060, 7740, 7841, 7471
	1	Soil	pH, TOC, grain size	*
Southwest Leach Field	4 a	Soil	PP VOCs+10	SW846 8240 or 8260
	1	Soil	PP Semi-volatiles	SW846 8270
		Soil	PP Metals	6010, 7060, 7740, 7841, 7471
	1	Soil	pH, TOC, grain size	*
Leach Field Sewer Line	13 a,b	Soil	PP VOCs+10	SW846 8240 or 8260
	1	Soil	PP Semi-volatiles.	SW846 8270
		Soil	PP Metals	6010, 7060, 7740, 7841, 7471

Soil sampling intervals will be determined based on field screening with a PID.

TOC	Total Organic Carbon
PP	Priority Pollutant
VOCs+10	Volatile Organic Compounds plus a library search, including xylenes and acetone
MTBE	Methyl Tertiary Butyl Ether
TBA	Tertiary Butyl Alcohol
*	pH: 9040 or 150.0
*	TOC: 9060 or 415.1
a	Additional samples may be collected based on field screening results with a PID.
b	Sampling locations will be determined by the number of breaches that are potentially identified during video survey, and by the location of overhead and underground utilities.
c	Additional soil samples may be collected pending the groundwater sampling results from MW-MT.

Table 3-1
Proposed Sampling Summary

Area	Number of Samples	Matrix	Analytical Paramters	Analytical Method
MW-20 Area	1	Groundwater (MW-MT)	PP VOCs+10	SW846 8240 or 8260
	6 c	Soil	PP VOCs+10	SW846 8240 or 8260
Process Sewer Line System	~ 22 b	Soil	PP VOCs+10	SW846 8240 or 8260
	3	Soil	PP Semi-volatiles	SW846 8270
Former Gasoline UST Excavation	~ 4 a	Soil	PP VOCs+10	SW846 8240 or 8260
	3	Groundwater	PP VOCs+10	SW846 8240 or 8260
		Groundwater	MTBE, TBA	SW846 8240 or 8260
		Groundwater	Lead	7421
Building D Floor Drains	1	Sediment	TPH	8015M, 418.1 or 5520E&F
		Sediment	PP VOCs+10	SW846 8240 or 8260
		Sediment	PP Semi-volatiles	SW846 8270

+ ? Metals

Need ?

Metals

Soil sampling intervals will be determined based on field screening with a PID.

TOC	Total Organic Carbon
PP	Priority Pollutant
VOCs+10	Volatile Organic Compounds plus a library search, including xylenes and acetone
MTBE	Methyl Tertiary Butyl Ether
TBA	Tertiary Butyl Alcohol
*	pH: 9040 or 150.0
*	TOC: 9060 or 415.1
a	Additional samples may be collected based on field screening results with a PID.
b	Sampling locations will be determined by the number of breaches that are potentially identified during video survey, and by the location of overhead and underground utilities.
c	Additional soil samples may be collected pending the groundwater sampling results from MW-MT.

TABLE 3-2

PROPOSED FORMAT FOR REVISED RFI REPORT

Section Title

1.0 Introduction

1.1 Background and Purpose of the RFI
(A brief discussion of the reason the RFI has been conducted and a discussion of the chronology of events leading up to the Revised RFI Report.)

1.2 Scope of Work
(The scope of work will be reviewed. Any approved changes/modifications made to the scope of work during the RFI will be listed here briefly and/or referred to the appropriate section of the report for further details.)

2.0 Description of Current Conditions
(This section will contain information generated during the evaluation of the Facility Background per Section 3.1 of this RFI Work Plan Addendum, as well as information already contained in the draft RFI Report.)

3.0 Facility Environmental Setting
(This section will contain the information generated during evaluation of the environmental setting data as discussed in Section 3.2 of this RFI Work Plan Addendum, as well as information already contained in the draft RFI Report.)

4.0 Contaminant Characterization
(This section will present the findings of the Contaminant Characterization as outlined in Section 3.3 of this RFI Work Plan Addendum, as well as information already contained in the draft RFI Report.)

5.0 Risk Assessment

6.0 Conclusions and Recommendations

TABLE 4-1

ERRATA SHEET TO DATA COLLECTION QUALITY ASSURANCE PLAN

SECTION/PAGE NO.	PARAGRAPH	REVISION
1.0 Project Description Page 1 of 1	2	Delete the first bullet, "Subsurface electromagnetic investigations to estimate the areal extent of the leach fields."
4.1 Uses of Data Page 1 of 4	1	Delete last sentence, "Geo-physical logging of the monitoring wells will be used for this purpose."
Global Changes	throughout	Replace references to "Dames & Moore" with McLaren/Hart, and "York laboratories" with Envirotech Research, Inc. ~~American Environmental Network, Inc.~~
5.1.2 Drilling Procedures Page 4 of 12	4	Add the sentence, Testing borings and wells will be abandoned in accordance with NJDEP protocols by a well sealer licensed by the State of New Jersey."
5.1.3 Monitor Well Construction Page 5 of 12	5	Change last sentence to read, "Allow grout to set overnight."
5.2 Slug testing Procedures, Page 11 of 12	1	Change second sentence to read, "Water levels will be measured using a Hermit data logger or Telog recorder and pressure transducer

TABLE 4-1

ERRATA SHEET TO DATA COLLECTION QUALITY ASSURANCE PLAN (Cont'd)

5.2 Slug Testing Procedures Page 12 of 12	3	Delete the last two sentences of paragraph 3 beginning with "Dames & Moore's computer...." Add the sentence, "Slug test data will be analyzed using the computer program AQTESOLV."
6.2 Well Sampling Procedures Page 3 of 15	3	Modifying first sentence to read "A Model Number 100 EN/M Oil Recovery Systems interface probe, or equivalent"...
6.2 Well Sampling Procedures Page 4 of 15	1	After the second sentence add, "Well purging rates should be kept low enough to avoid overpumping, or drying out the well. If a well has been pumped to near dryness at a rate less than 0.5 gpm, the well should be allowed to recover and then sampled."
5.2 Slug Testing Procedures Page 11 of 12	2	Change sentence to read, "Rinse the cylindrical steel or PVC slug with distilled water."

TABLE 4-1

ERRATA SHEET TO DATA COLLECTION QUALITY ASSURANCE PLAN (Cont'd)

5.2 Slug Testing Procedures Page 11 of 12	3	Modifying sentence to read "Start the Hermit or Telog recorder and then lower the slug rapidly, but smoothly, into the water column of the well, noting the time of slug introduction."
5.2 Slug Testing Procedures Page 11 of 12	4	Delete the paragraph beginning "At frequent intervals......"
6.2 Well Sampling Procedures Page 4 of 15	1	Modifying the sentence, "During purging, pH....", The temperature, pH, conductivity and dissolved oxygen of the well water shall be checked prior to, and after purging."
6.2 Well Sampling Procedures Page 4 of 15	4	Modifying the first sentence to read, "Sample the well within 2 hours of purging". Delete Item No. 6 starting at the third sentence and replace with, "All groundwater samples will be collected using disposable teflon bailer with dedicated length of clean polypropylene line."
6.2 Well Sampling Procedures Page 6 of 15	Item No. 8	Add the following two items to the list of information for sample bottles; 5) Analysis Requested and 6) Type of Preservative, if any.

TABLE 4-1

ERRATA SHEET TO DATA COLLECTION QUALITY ASSURANCE PLAN
(Cont'd)

6.2 Well Sampling Procedures Page 7 of 15	Item No. 9	Replace the first sentence with, "The pH, temperature conductivity and dissolved oxygen will be checked prior to and after purging at each well." Delete the third sentence, "The field tests include temperature, pH and specific conductivity."
Table 2	Item No. 6	Add, "Record the pH, temperature, specific conductivity and dissolved oxygen before and after purging."
Table 2	Item No. 8	Modifying first sentence to read, "Sample will using disposable teflon bailers."

Figure 2-1
Project Schedule for RCRA Facility Investigation
Ortho Diagnostic Systems, Inc.
Raritan, NJ

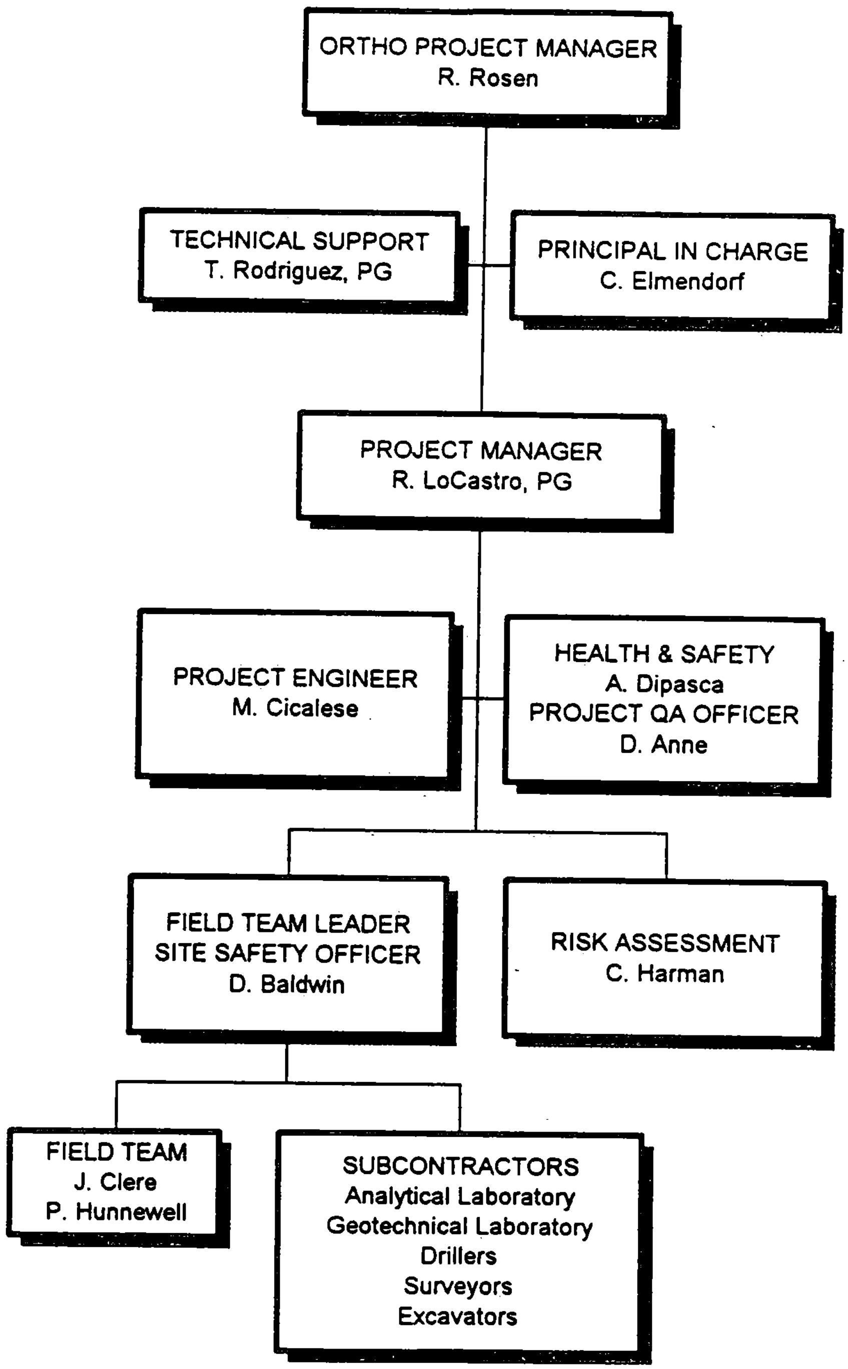
WEEKS FROM DATE OF EPA APPROVAL

ACTIVITY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
PHASE I INVESTIGATION																					
Scheduling of Field Activities	■	■																			
Video Survey of Leach Field and Process Sewer Lines			■																		
Sampling of Groundwater from MW-MT			■																		
Sewage Lift Station Clean Out and Inspection			■																		
Sampling of Process/Sanitary Effluent			■																		
Sampling of Sediment at East Storm Water Outfall			■																		
Excavation of Test Pits - NE and SW Leach Fields and Process Sewer Line				■	■	■															
* Test Borings/Mobile Laboratory Program - MW-20 Area					■	■															
* Test Borings/Mobile Laboratory Program - Leach Fields						■	■														
* Test Borings/Mobile Laboratory Program - Leach Field Sewer Line							■	■													
* Test Borings/Mobile Laboratory Program - Process Sewer Line								■	■												
* Test Borings/Mobile Laboratory Program - Former Gasoline UST									■	■											
Geotechnical Sampling				■																	
Laboratory Analysis			■	■	■	■	■	■	■	■	■	■	■								
DATA REVIEW AND REPORTING																					
Data Validation														■							
Data Review and Evaluation				■	■	■	■	■	■	■	■	■	■	■	■	■					
Preparation of data tables and figures															■	■	■	■	■		
Meeting with EPA to Review Phase I Results & Discuss Phase II																					■

* Activity dependent on site conditions that are encountered.

Note: The project schedule for Phase II activities will be discussed during the proposed meeting with EPA.

FIGURE 2-2
PROJECT ORGANIZATION CHART
RCRA FACILITY INVESTIGATION
ORTHO DIAGNOSTIC SYSTEMS INC.



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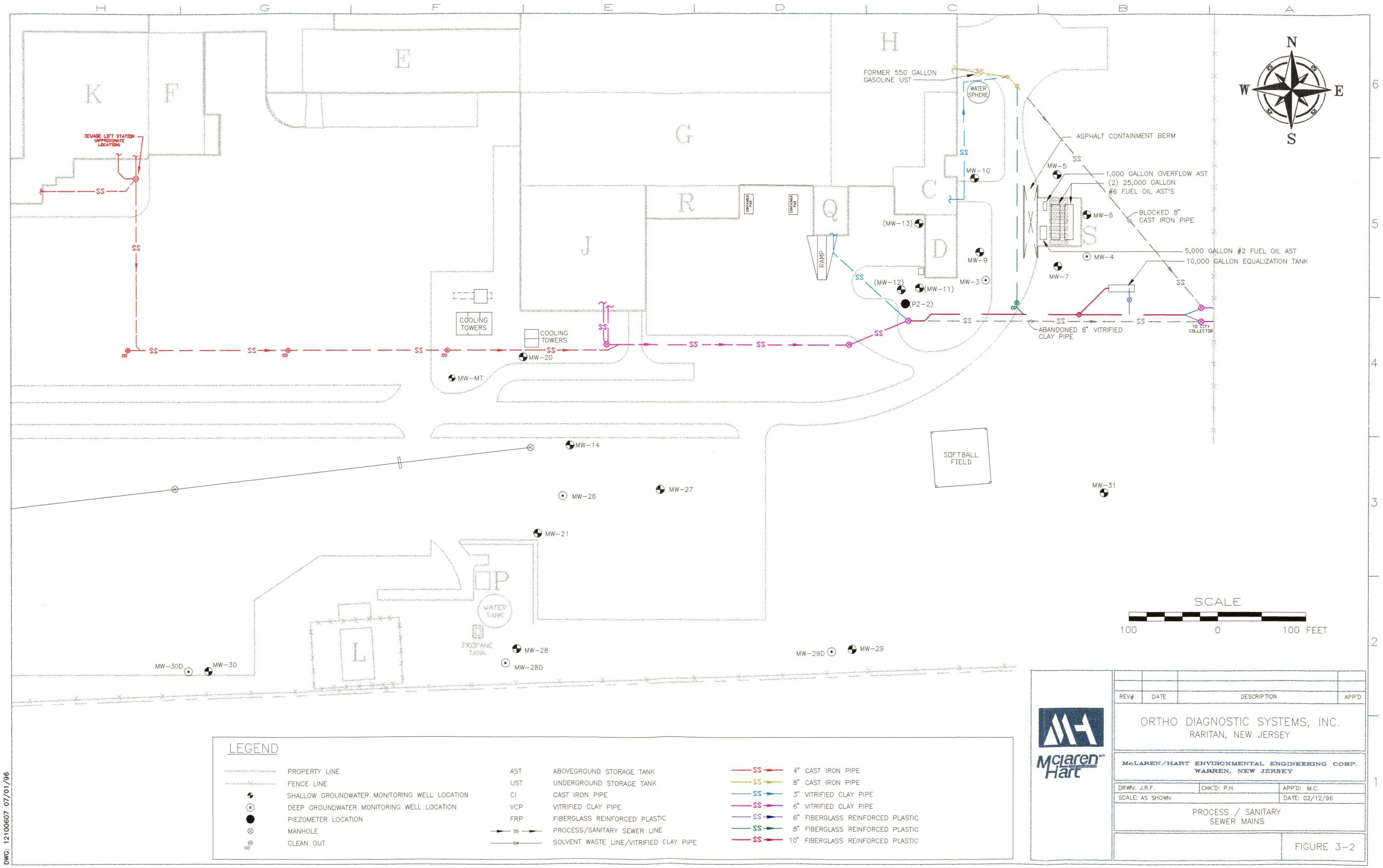

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RAMP
SEWAGE LIFT STATION (APPROXIMATE LOCATION)
FORMER 550 GALLON GASOLINE UST
WATER SPHERE
ASPHALT CONTAINMENT BERM
1,000 GALLON OVERFLOW AST
(2) 25,000 GALLON #6 FUEL OIL AST'S
BLOCKED 8" CAST IRON PIPE
5,000 GALLON #2 FUEL OIL AST
10,000 GALLON EQUALIZATION TANK
ABANDONED 6" VITRIFIED CLAY PIPE
TO CITY COLLECTOR
COOLING TOWERS
COOLING TOWERS
SOFTBALL FIELD
WATER TANK
PROPANE TANK
MW-5
MW-10
MW-6
(MW-13)
MW-9
MW-4
MW-7
MW-3
(MW-12)
(MW-11)
(PZ-2)
MW-20
MW-MT
MW-14
MW-26
MW-27
MW-21
MW-31
MW-28
MW-28D
MW-29D
MW-29
MW-30D
MW-30
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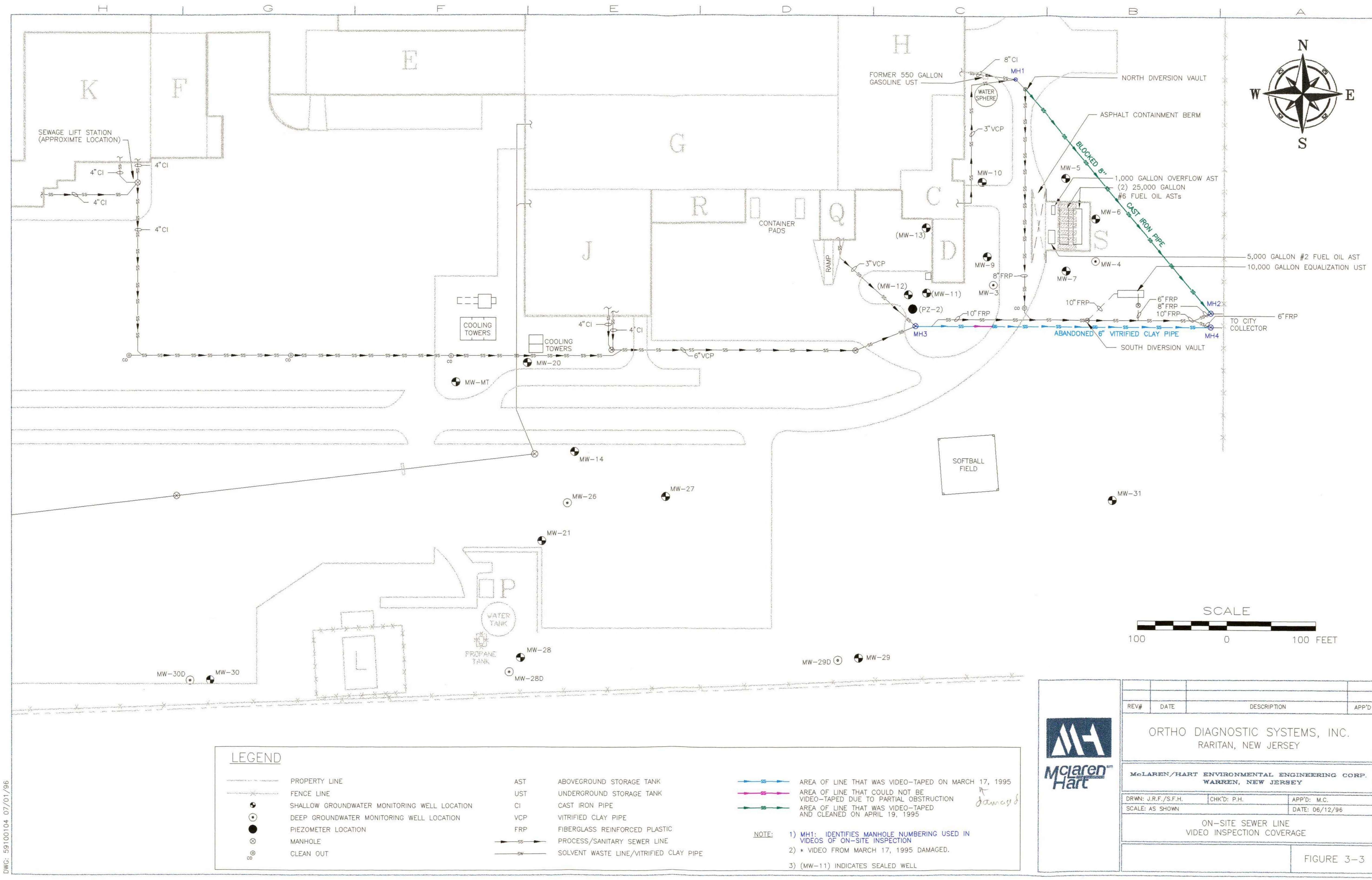
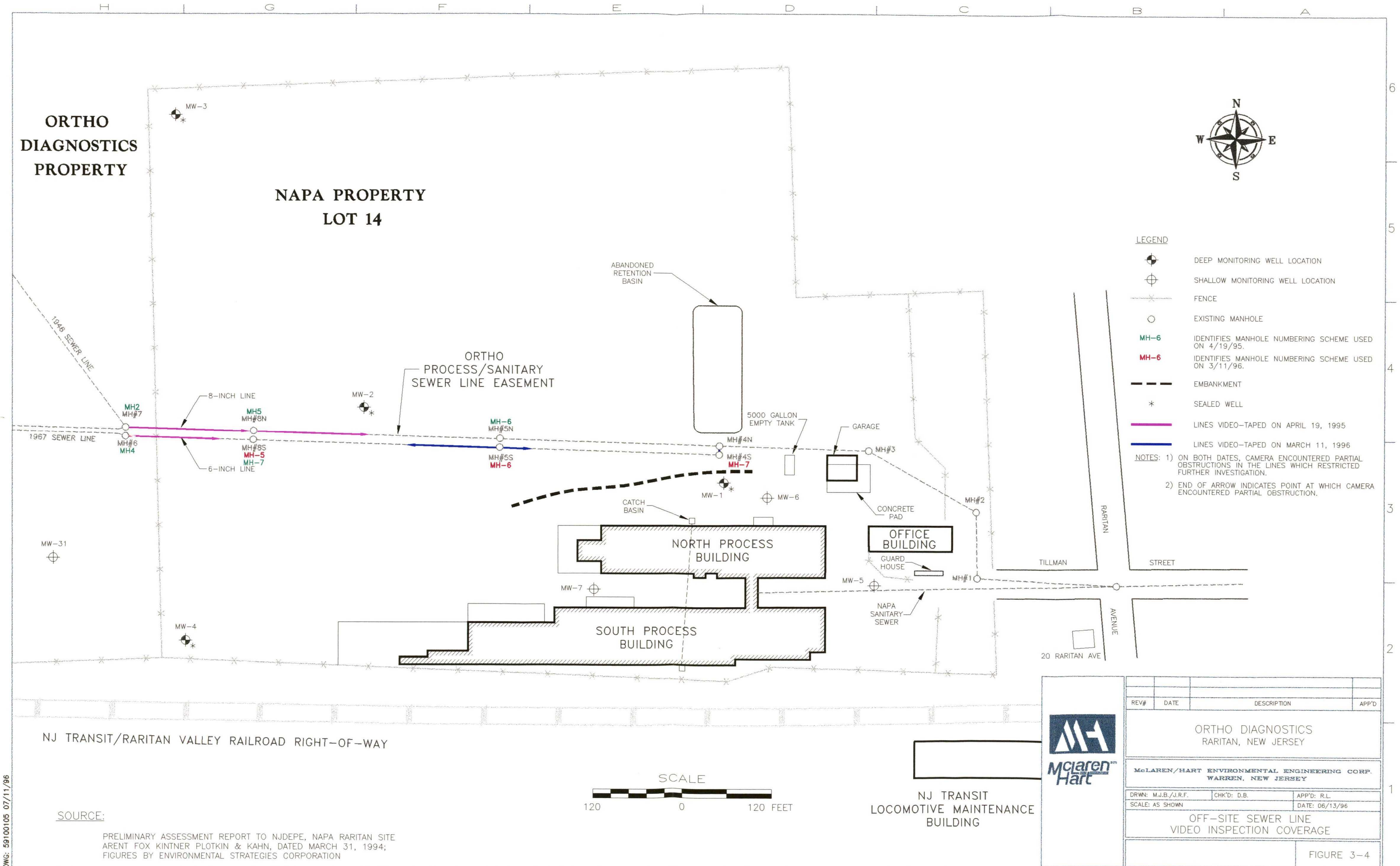
SCALE
100
0
100 FEET
LEGEND
PROPERTY LINE
FENCE LINE
SHALLOW GROUNDWATER MONITORING WELL LOCATION
DEEP GROUNDWATER MONITORING WELL LOCATION
PIEZOMETER LOCATION
MANHOLE
CLEAN OUT
AST ABOVEGROUND STORAGE TANK
UST UNDERGROUND STORAGE TANK
CI CAST IRON PIPE
VCP VITRIFIED CLAY PIPE
FRP FIBERGLASS REINFORCED PLASTIC
PROCESS/SANITARY SEWER LINE
SOLVENT WASTE LINE/VITRIFIED CLAY PIPE
4" CAST IRON PIPE
8" CAST IRON PIPE
3" VITRIFIED CLAY PIPE
6" VITRIFIED CLAY PIPE
6" FIBERGLASS REINFORCED PLASTIC
8" FIBERGLASS REINFORCED PLASTIC
10" FIBERGLASS REINFORCED PLASTIC
McLaren Hart
REV# DATE DESCRIPTION APP'D
ORTHO DIAGNOSTIC SYSTEMS, INC.
RARITAN, NEW JERSEY
McLAREN/HART ENVIRONMENTAL ENGINEERING CORP.
WARREN, NEW JERSEY
DRWN: J.R.F.
CHK'D: P.H.
APP'D: M.C.
SCALE: AS SHOWN
DATE: 02/12/96
PROCESS / SANITARY SEWER MAINS
FIGURE 3-2
DWG: 12100607 07/01/96



SEWAGE LIFT STATION (APPROXIMTE LOCATION)
4"CI
FORMER 550 GALLON GASOLINE UST
8"CI
MH1
NORTH DIVERSION VAULT
WATER SPHERE
3"VCP
ASPHALT CONTAINMENT BERM
BLOCKED 8" CAST IRON PIPE
MW-5
MW-10
1,000 GALLON OVERFLOW AST
(2) 25,000 GALLON #6 FUEL OIL ASTs
MW-6
CONTAINER PADS
(MW-13)
RAMP
MW-9
MW-4
5,000 GALLON #2 FUEL OIL AST
10,000 GALLON EQUALIZATION UST
3"VCP
8"FRP
MW-7
(MW-12)
(MW-11)
MW-3
(PZ-2)
10"FRP
6"FRP
8"FRP
MH2
6"FRP
TO CITY COLLECTOR
MH3
ABANDONED 6" VITRIFIED CLAY PIPE
MH4
SOUTH DIVERSION VAULT
COOLING TOWERS
4"CI
6"VCP
MW-20
MW-MT
MW-14
SOFTBALL FIELD
MW-26
MW-27
MW-31
MW-21
WATER TANK
PROPANE TANK
MW-28
MW-28D
MW-30D
MW-30
MW-29D
MW-29
SCALE
100 0 100 FEET
LEGEND
PROPERTY LINE
FENCE LINE
SHALLOW GROUNDWATER MONITORING WELL LOCATION
DEEP GROUNDWATER MONITORING WELL LOCATION
PIEZOMETER LOCATION
MANHOLE
CLEAN OUT
AST ABOVEGROUND STORAGE TANK
UST UNDERGROUND STORAGE TANK
CI CAST IRON PIPE
VCP VITRIFIED CLAY PIPE
FRP FIBERGLASS REINFORCED PLASTIC
PROCESS/SANITARY SEWER LINE
SOLVENT WASTE LINE/VITRIFIED CLAY PIPE
AREA OF LINE THAT WAS VIDEO-TAPED ON MARCH 17, 1995
AREA OF LINE THAT COULD NOT BE VIDEO-TAPED DUE TO PARTIAL OBSTRUCTION
damaged
AREA OF LINE THAT WAS VIDEO-TAPED AND CLEANED ON APRIL 19, 1995
NOTE: 1) MH1: IDENTIFIES MANHOLE NUMBERING USED IN VIDEOS OF ON-SITE INSPECTION
2) * VIDEO FROM MARCH 17, 1995 DAMAGED.
3) (MW-11) INDICATES SEALED WELL
REV# DATE DESCRIPTION APP'D
ORTHO DIAGNOSTIC SYSTEMS, INC.
RARITAN, NEW JERSEY
McLAREN/HART ENVIRONMENTAL ENGINEERING CORP.
WARREN, NEW JERSEY
DRWN: J.R.F./S.F.H.
CHK'D: P.H.
APP'D: M.C.
SCALE: AS SHOWN
DATE: 06/12/96
ON-SITE SEWER LINE VIDEO INSPECTION COVERAGE
FIGURE 3-3
DWG: 59100104 07/01/96


H
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ORTHO DIAGNOSTICS PROPERTY
NAPA PROPERTY LOT 14
MW-3
N
S
W
E
LEGEND
DEEP MONITORING WELL LOCATION
SHALLOW MONITORING WELL LOCATION
FENCE
EXISTING MANHOLE
MH-6 IDENTIFIES MANHOLE NUMBERING SCHEME USED ON 4/19/95.
MH-6 IDENTIFIES MANHOLE NUMBERING SCHEME USED ON 3/11/96.
EMBANKMENT
SEALED WELL
LINES VIDEO-TAPED ON APRIL 19, 1995
LINES VIDEO-TAPED ON MARCH 11, 1996
NOTES: 1) ON BOTH DATES, CAMERA ENCOUNTERED PARTIAL OBSTRUCTIONS IN THE LINES WHICH RESTRICTED FURTHER INVESTIGATION.
2) END OF ARROW INDICATES POINT AT WHICH CAMERA ENCOUNTERED PARTIAL OBSTRUCTION.
ABANDONED RETENTION BASIN
1946 SEWER LINE
ORTHO PROCESS/SANITARY SEWER LINE EASEMENT
8-INCH LINE
6-INCH LINE
MW-2
MH2
MH#7
MH#6
MH4
1967 SEWER LINE
MH5
MH#8N
MH#8S
MH-5
MH-7
MH-6
MH#5N
MH#5S
MH-6
5000 GALLON EMPTY TANK
MH#4N
MH#4S
MH-7
GARAGE
MH#3
MW-1
MW-6
CONCRETE PAD
MH#2
CATCH BASIN
NORTH PROCESS BUILDING
OFFICE BUILDING
GUARD HOUSE
RARITAN
TILLMAN
STREET
AVENUE
MW-31
MW-7
MW-5
MH#1
NAPA SANITARY SEWER
MW-4
SOUTH PROCESS BUILDING
20 RARITAN AVE
NJ TRANSIT/RARITAN VALLEY RAILROAD RIGHT-OF-WAY
SCALE
120
0
120 FEET
NJ TRANSIT LOCOMOTIVE MAINTENANCE BUILDING
REV# DATE DESCRIPTION APP'D
ORTHO DIAGNOSTICS
RARITAN, NEW JERSEY
McLaren Hart
McLAREN/HART ENVIRONMENTAL ENGINEERING CORP.
WARREN, NEW JERSEY
DRWN: M.J.B./J.R.F.
CHK'D: D.B.
APP'D: R.L.
SCALE: AS SHOWN
DATE: 06/13/96
OFF-SITE SEWER LINE VIDEO INSPECTION COVERAGE
FIGURE 3-4
SOURCE:
PRELIMINARY ASSESSMENT REPORT TO NJDEPE, NAPA RARITAN SITE
ARENT FOX KINTNER PLOTKIN & KAHN, DATED MARCH 31, 1994;
FIGURES BY ENVIRONMENTAL STRATEGIES CORPORATION
DWG: 59100105 07/11/96